SUUNTO DX
USER'S GUIDE

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1. WELCOME TO THE WORLD OF SUUNTO DIVE COMPUTERS

Suunto DX wristop dive computer is designed to help you get the most out of your diving.

Suunto DX is the world’s first wristop sized dive computer to integrate rebreather and trimix compatibility, a tilt-compensated 3D digital compass, and wireless tank pressure reception into one compact unit. It simplifies your diving experience because all the information you need relating to depth, time, optional tank pressure, decompression status, and direction is now available on one easy-to-read screen.

The Suunto DX User's Guide contains vitally important information which enables you to become familiar with your Suunto wristop dive computer. To understand the use, displays, and limitations of the instrument before using it, please read this user's guide carefully, and save it for further reference. Note also that a glossary is included at the back of the user's guide to help you understand dive-specific terminology.

2. WARNINGS, CAUTIONS, AND NOTES

Throughout this user's guide, important safety icons are displayed. Three classifications are used to separate these icons by their order of importance:

WARNING *is used in connection with a procedure or situation that may result in serious injury or death*

CAUTION *is used in connection with a procedure or situation that will result in damage to the device*

NOTE *is used to emphasize important information*

Before you go on to read the user's guide itself, it is extremely important that you read the following warnings. These warnings are intended to maximize your safety while using Suunto DX and must not be ignored.

WARNING *YOU MUST READ the leaflet and user guide for your dive computer. Failure to do so may lead to improper use, serious injury or death.*

WARNING *ALLERGIC REACTIONS OR SKIN IRRITATIONS MAY OCCUR WHEN PRODUCT IS IN CONTACT WITH SKIN, EVEN THOUGH OUR PRODUCTS COMPLY WITH INDUSTRY STANDARDS. IN SUCH EVENT, STOP USE IMMEDIATELY AND CONSULT A DOCTOR.*

⚠ WARNING

NOT FOR PROFESSIONAL USE! Suunto dive computers are intended for recreational use only. The demands of commercial or professional diving may expose the diver to depths and conditions that tend to increase the risk of decompression sickness (DCS). Therefore, Suunto strongly recommends that the device not be used for any commercial or professional diving activities.

⚠ WARNING

ONLY DIVERS TRAINED IN PROPER USE OF SCUBA DIVING EQUIPMENT SHOULD USE A DIVE COMPUTER! No dive computer can replace the need for proper dive training. Insufficient or improper training may cause a diver to commit errors that may lead to serious injury or death.

⚠ WARNING

THERE IS ALWAYS A RISK OF DECOMPRESSION SICKNESS (DCS) FOR ANY DIVE PROFILE EVEN IF YOU FOLLOW THE DIVE PLAN PRESCRIBED BY DIVE TABLES OR A DIVE COMPUTER. NO PROCEDURE, DIVE COMPUTER OR DIVE TABLE WILL PREVENT THE POSSIBILITY OF DCS OR OXYGEN TOXICITY! An individual's physiological make up can vary from day to day. The dive computer cannot account for these variations. You are strongly advised to remain well within the exposure limits provided by the instrument to minimize the risk of DCS. As an added measure of safety, you should consult a physician regarding your fitness before diving.

⚠ WARNING

SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS LIMIT THEIR MAXIMUM DEPTH TO 40 M/130 FT OR TO THE DEPTH CALCULATED BY THE COMPUTER BASED ON THE SELECTED O_2% AND A MAXIMUM PO_2 OF 1.4 BAR! Exposure to greater depths increases the risk of oxygen toxicity and decompression sickness.

⚠ WARNING

DIVES WITH REQUIRED DECOMPRESSION STOPS ARE NOT RECOMMENDED. YOU SHOULD ASCEND AND BEGIN DECOMPRESSION IMMEDIATELY WHEN THE DIVE COMPUTER SHOWS YOU THAT A DECOMPRESSION STOP IS REQUIRED! Note the blinking ASC TIME symbol and the upward pointing arrow.

⚠ WARNING

USE BACK-UP INSTRUMENTS! Ensure that you use back-up instrumentation, including a depth gauge, submersible pressure gauge, timer or watch, and have access to decompression tables whenever diving with the dive computer.

⚠ WARNING

PERFORM PRE-CHECKS! Always activate and check the device before diving in order to ensure that all Liquid Crystal Display (LCD) segments are completely displayed, the device has not run out of battery power, and that the oxygen, altitude, personal, and Safety/Deep Stop are correct.

⚠ WARNING

YOU ARE ADVISED TO AVOID FLYING ANY TIME THE COMPUTER COUNTS DOWN THE NO-FLY TIME. ALWAYS ACTIVATE THE COMPUTER TO CHECK THE REMAINING NO-FLY TIME PRIOR TO FLYING! Flying or traveling to a higher altitude within the no-fly time can greatly increase the risk of DCS. Review the recommendations given by Divers Alert Network (DAN). There can never be a flying after diving rule that is guaranteed to completely prevent decompression sickness!

⚠ WARNING

THE DIVE COMPUTER SHOULD NEVER BE TRADED OR SHARED BETWEEN USERS WHILE IT IS IN OPERATION! Its information will not apply to someone who has not been wearing it throughout a dive or sequence of repetitive dives. Its dive profiles must match that of the user. If it is left on the surface during any dive, the dive computer will give inaccurate information for subsequent dives. No dive computer can take into account dives made without the computer. Thus, any diving activity up to four days prior to initial use of the computer may cause misleading information and must be avoided.

⚠ WARNING

DO NOT EXPOSE ANY PART OF YOUR DIVE COMPUTER TO ANY GAS MIX CONTAINING MORE THAN 40% OXYGEN! Enriched air with greater oxygen content presents a risk of fire or explosion and serious injury or death.

⚠ WARNING

THE DIVE COMPUTER WILL NOT ACCEPT FRACTIONAL PERCENTAGE VALUES OF OXYGEN CONCENTRATION. DO NOT ROUND UP FRACTIONAL PERCENTAGES! For example, 31.8% oxygen should be entered as 31%. Rounding up will cause nitrogen percentages to be understated and will affect decompression calculations. If there is a desire to adjust the computer to provide more conservative calculations, use the personal adjustment feature to affect decompression calculations or reduce the PO_2 setting to affect oxygen exposure according to the entered O_2% and PO_2 values. As a safety precaution, the oxygen calculations in the dive computer are made with an oxygen percentage of 1% + set O_2%.

⚠ WARNING

SET THE CORRECT ALTITUDE ADJUSTMENT MODE! When diving at altitudes greater than 300 m/1000 ft, the Altitude Adjustment feature must be correctly selected in order for the computer to calculate the decompression status. The dive computer is not intended for use at altitudes greater than 3000 m/10000 ft. Failure to select the correct Altitude Adjustment setting or diving above the maximum altitude limit will result in erroneous dive and planning data.

⚠ WARNING

SET THE CORRECT PERSONAL ADJUSTMENT MODE! Whenever it is believed that factors that tend to increase the possibility of DCS exist, it is recommended that you use this option to make the calculations more conservative. Failure to select the correct Personal Adjustment setting will result in erroneous dive and planning data.

⚠ WARNING

DO NOT EXCEED THE MAXIMUM ASCENT RATE! Rapid ascents increase the risk of injury. You should always make the Mandatory and Recommended Safety Stops after you have exceeded the maximum recommended ascent rate. If this Mandatory Safety Stop is not completed the decompression model will penalize your next dive(s).

⚠ WARNING

YOUR ACTUAL ASCENT TIME MAY BE LONGER THAN DISPLAYED BY THE INSTRUMENT! The ascent time will increase if you:

- *remain at depth*
- *ascend slower than 10 m/min / 33 ft/min or*
- *make your decompression stop deeper than at the ceiling*

These factors will also increase the amount of breathing gas required to reach the surface.

⚠ WARNING

NEVER ASCEND ABOVE THE CEILING! You must not ascend above the ceiling during your decompression. In order to avoid doing so by accident, you should stay somewhat below the ceiling.

⚠ WARNING

DO NOT DIVE WITH A CYLINDER OF ENRICHED AIR IF YOU HAVE NOT PERSONALLY VERIFIED ITS CONTENTS AND ENTERED THE ANALYZED VALUE INTO YOUR DIVE COMPUTER! Failure to verify cylinder contents and enter the appropriate O_2% into your dive computer will result in incorrect dive planning information.

⚠ WARNING

DO NOT DIVE WITH A GAS IF YOU HAVE NOT PERSONALLY VERIFIED ITS CONTENTS AND ENTERED THE ANALYZED VALUE INTO YOUR DIVE COMPUTER! Failure to verify cylinder contents and enter the appropriate gas values where applicable into your dive computer will result in incorrect dive planning information.

⚠ WARNING

Diving with gas mixtures exposes you to risks that are different from those associated with diving with standard air. These risks are not obvious, and require training to understand and avoid. Risks include possible serious injury or death.

⚠ WARNING

Traveling to a higher elevation can temporarily cause a change in the equilibrium of dissolved nitrogen in the body. It is recommended that you acclimatize to the new altitude by waiting at least three hours before diving.

⚠ WARNING

WHEN THE OXYGEN LIMIT FRACTION INDICATES THAT THE MAXIMUM LIMIT IS REACHED, YOU MUST IMMEDIATELY TAKE ACTION TO REDUCE OXYGEN EXPOSURE. Failure to take action to reduce oxygen exposure after the warning is given can rapidly increase the risk of oxygen toxicity, injury, or death

⚠ WARNING

If there are several divers using the dive computer with wireless transmission, always ensure that each diver is using a different code before starting the dive.

⚠ WARNING

Personal adjustment setting P0–P-2 causes a high risk of DCS, or other personal injury, and death.

⚠ WARNING

Using the Suunto Dive Planner software is not a substitute for proper dive training. Diving with mixed gases has dangers that are not familiar to divers diving with air. To dive with trimix, triox, heliox and nitrox or all of them, divers must have specialized training for the type of diving they are doing.

⚠ WARNING *Always use realistic SAC rates and conservative turn pressures during dive planning. Overly optimistic or erroneous gas planning can result in the exhaustion of breathing gas during decompression or in a cave or a wreck.*

⚠ WARNING *ENSURE THE WATER RESISTANCE OF THE DEVICE! Moisture inside the device and/or battery compartment may seriously damage the unit. Only an authorized SUUNTO service center should do service activities.*

⚠ WARNING *Do not use Suunto USB Cable in areas where flammable gases are present. Doing so may cause an explosion.*

⚠ WARNING *Do not disassemble or remodel Suunto USB Cable in any way. Doing so may cause an electric shock or fire.*

⚠ WARNING *Do not use if Suunto USB Cable or parts are damaged.*

⚠ CAUTION *Only use at specified temperatures.*

⚠ CAUTION *Only use Suunto USB Cable with Suunto dive computers. Check compatibility before use.*

⚠ CAUTION *Only use a clean and dry Suunto USB Cable. Clean and dry the connector surfaces before use to prevent damage to the Suunto dive computer.*

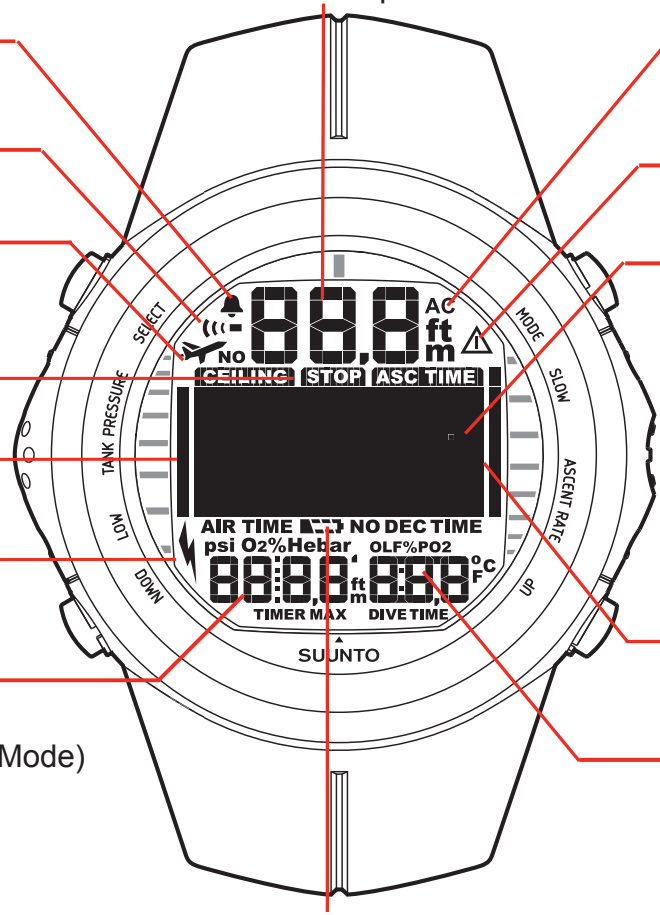
⚠ CAUTION *Only attach Suunto USB Cable to the data transfer contact on the Suunto dive computer.*

⚠ CAUTION *Never lift or carry your cylinder by holding the wireless tank pressure transmitter as this may break the cover and cause flooding of the unit. If your cylinder falls down with the transmitter attached to the regulator first stage, ensure that the transmitter has not been damaged before diving with it.*

NOTE *It is not possible to change to AIR mode after a dive in MIXED or CCR mode, before the No-fly time has elapsed.*
When planning both air and mixed gas/CCR dives during the same dive series, you should set the instrument in MIXED mode and modify the gas mix accordingly.

NOTE *In GAUGE mode the no-fly time is always 48 hours.*

3. SUUNTO USER INTERFACE



NOTE

If no button is pressed for 5 minutes, the dive computer beeps and returns to the TIME mode automatically.

3.1. Navigating in the menus

Suunto DX has four main operating modes - TIME mode (TIME), DIVE mode (DIVE), PLAN mode (PLAN), and MEMORY mode (MEM). It also has a COMPASS submode, which can be activated from either TIME or DIVE modes. To toggle between the main modes, press the MODE button. To select a submode in DIVE and MEM modes, press the UP/DOWN buttons.

COMPASS

SETTINGS

Calibrate
Declination
Timeout

TIME

LIGHT

SETTINGS

Alarm
Time
Dual Time
Date
Units
Backlight
Contrast
Tones

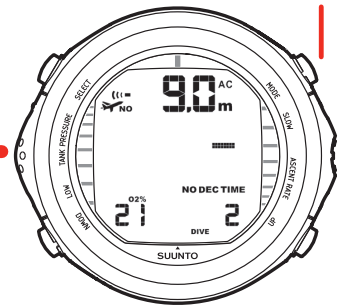
DIVE

LIGHT

SETTINGS

CC Gases
OC Gases / Gases
Set Point
Personal / Altitude
Tank Press Pairing
Tank Press Alarm
Depth Alarm
Dive Time Alarm
Sample Rate
Deepstop
Air Time

PLAN



LIGHT

SUB-MODES

Air
Mixed
CCR
Gauge
Off

MEM

LIGHT

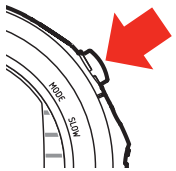
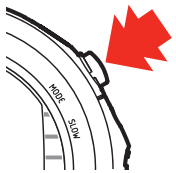
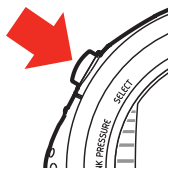
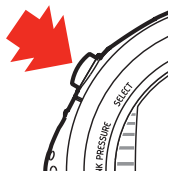
SUB-MODES

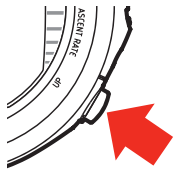
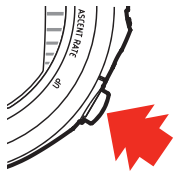
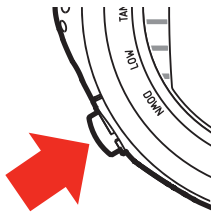
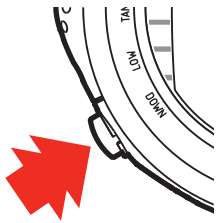
Logbook
History

3.2. Button symbols and functions

The table below explains the main functions of the dive computer's buttons. The buttons and their use is explained in more detail in the relevant sections of the user's guide.

Table 3.1. Button symbols and functions

Symbol	Button	Press	Main functions
	MODE	Short	Switch between main modes Switch from submode to main mode Activate backlight in DIVE mode
	MODE	Long	Activate backlight in other modes Activate stopwatch in DIVE mode
	SELECT	Short	Select a submode Select and accept settings Select stopwatch to stop or start in DIVE mode
	SELECT	Long	Activate compass in TIME and DIVE modes

Symbol	Button	Press	Main functions
	UP	Short	Toggle between alternative displays Change submode Increase values
	UP	Long	Activate gas switching in MIXED and CCR mode View gas selection in SURFACE mode (MIXED and CCR only). View set points and switch depths in SURFACE mode (CCR only).
	DOWN	Short	Toggle between alternative displays Change submode Decrease values
	DOWN	Long	Enter Setting mode Toggle between ceiling and remaining air time display

4. GETTING STARTED

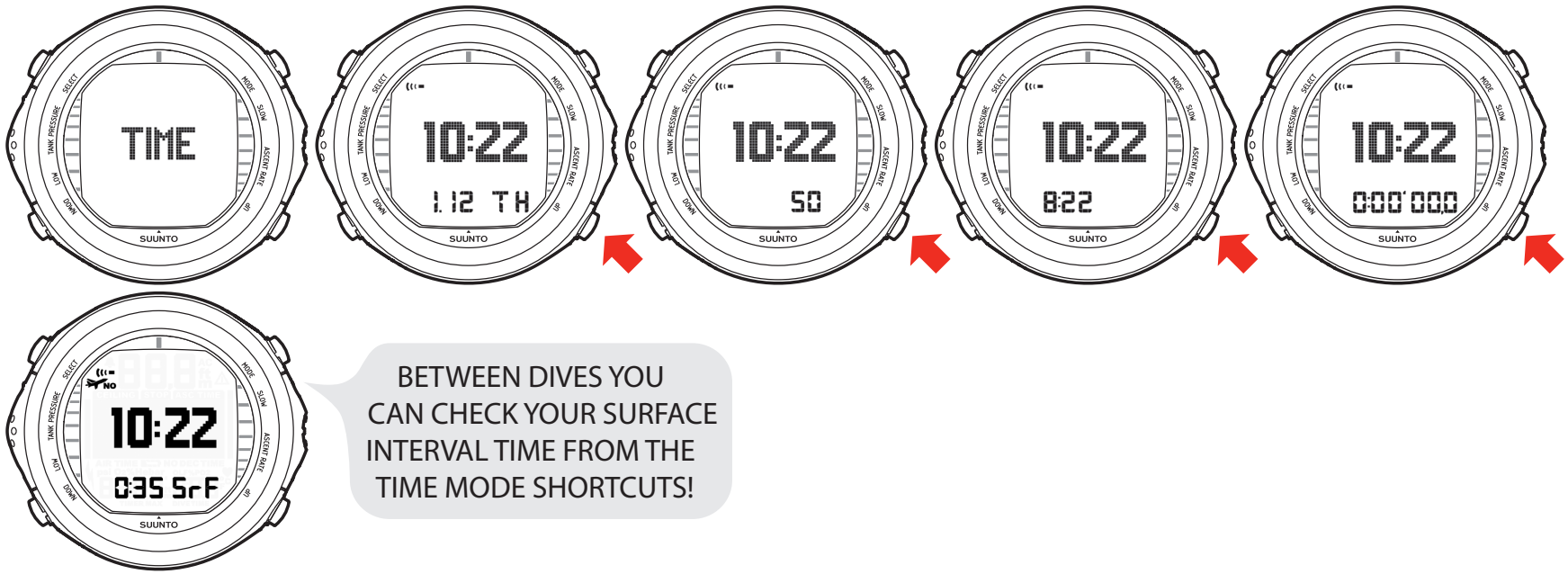
To get the most out of your Suunto DX, use some time to personalize it and really make it YOUR computer. Set the correct time and date, as well as the alarms and tones, unit and backlight settings. Then, calibrate and test the compass function.

Suunto DX is a very user-friendly dive computer, and you will quickly become familiar with its functions. Make absolutely sure that you know your computer and have it set up as you want it BEFORE getting into the water.

4.1. TIME mode settings

The first thing to do with your Suunto DX is to set the TIME mode shortcuts: the time, alarm, dual time, date, units, backlight, contrast, and tones.

The figure below shows how to toggle between different shortcuts in the TIME mode:

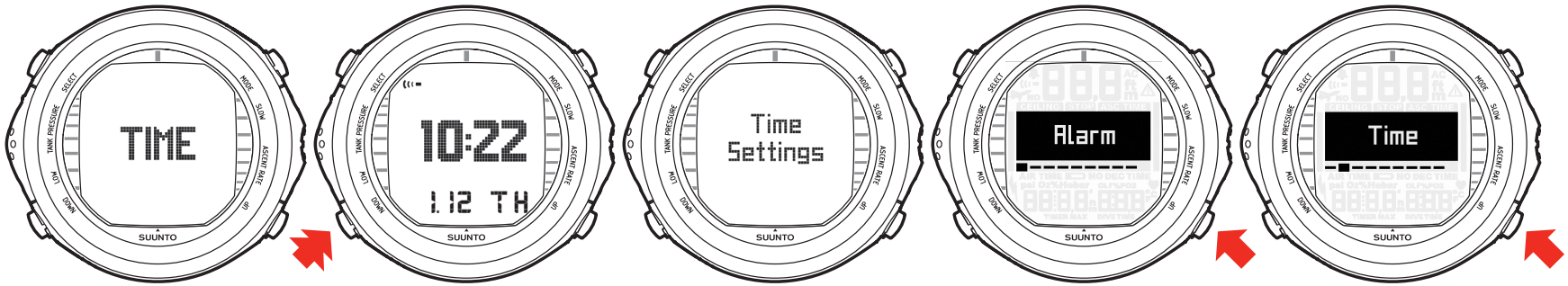


NOTE *The seconds display reverts to date display after 5 minutes in order to save battery power.*

NOTE *The display is illuminated by holding down the MODE button for more than 2 seconds.*

Now that after you know how to toggle between the shortcuts, you can start to set them.

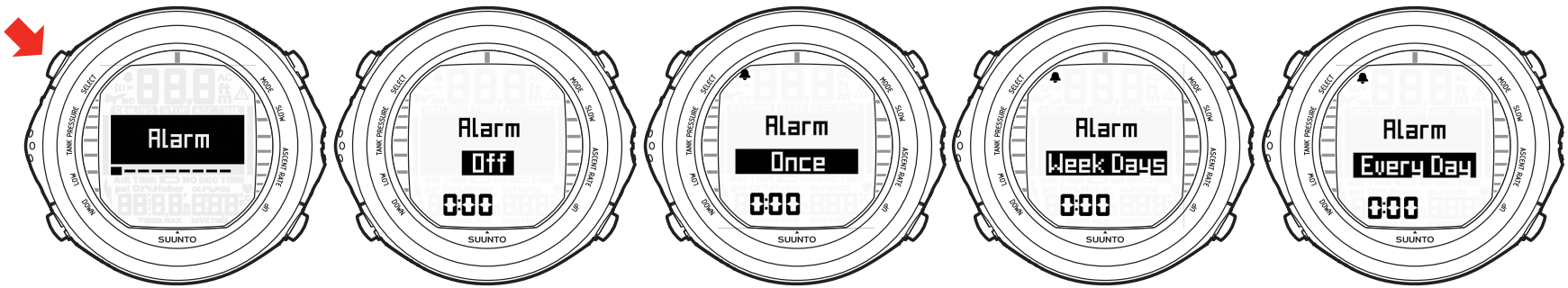
The figure below shows how to enter the TIME Settings menu.



USE UP AND DOWN BUTTONS TO TOGGLE BETWEEN ALARM, TIME, DUAL TIME, DATE, UNITS, CONTRAST, TONES AND VERSION.

4.1.1. Setting the alarm

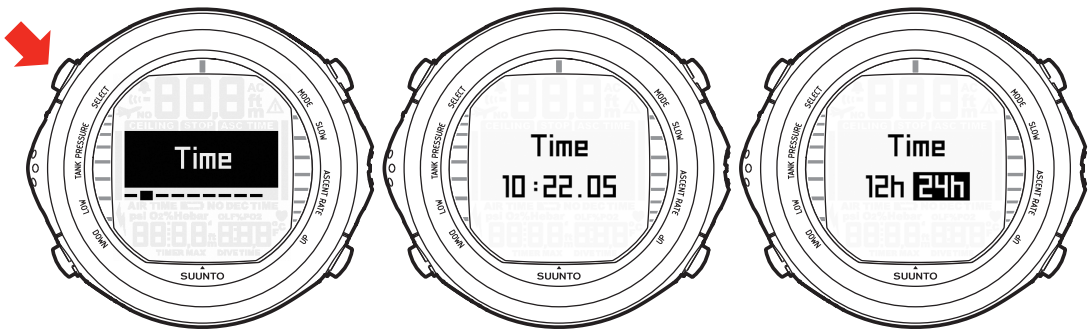
The dive computer has a daily alarm function. The alarm can be set to be activated only once, on weekdays or every day. When the daily alarm activates, the screen blinks and the alarm sounds for 60 seconds. Press any button to stop the alarm.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

4.1.2. Setting the time

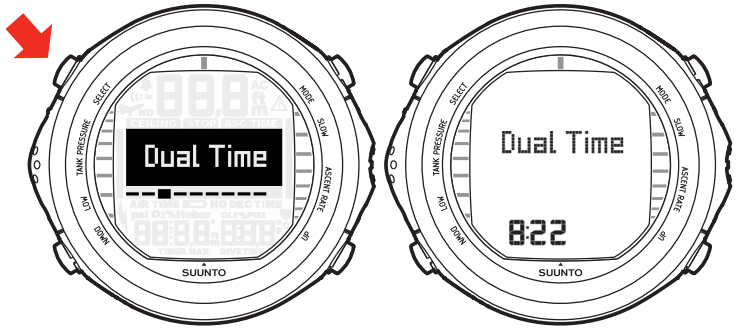
In the Time setting mode, you are able to set the hour, minute, and second, as well as choose between a 12 and 24 hour display.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

4.1.3. Setting the dual time

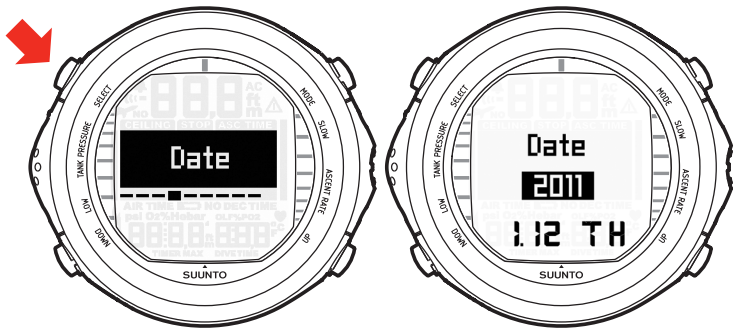
In the Dual Time setting mode, you are able to select the hour and minute of a dual time, which is useful when traveling to a different time zone.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

4.1.4. Setting the date

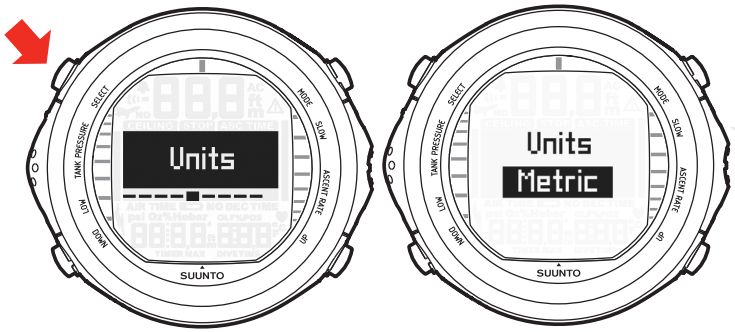
In the Date setting mode, you are able to set the year, month, and day. The day of the week is automatically calculated in accordance with the date. In metric units the date is presented as DD/MM, and in imperial units as MM/DD.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

4.1.5. Setting the units

In the Units setting mode, you are able to choose whether the units are displayed in either the metric or imperial system (meters/feet, Celsius/Fahrenheit, and so on).

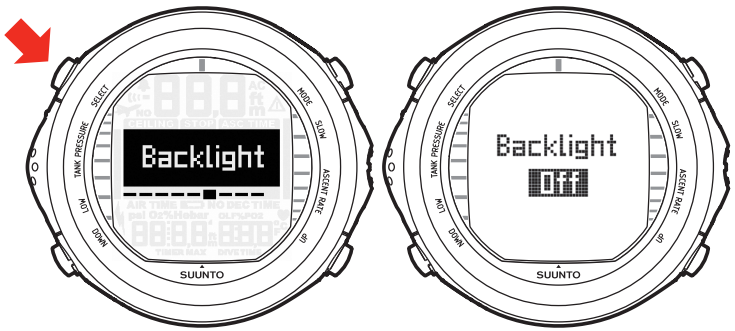


ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

4.1.6. Setting the backlight

In the Backlight setting mode, you are able to turn the backlight ON or OFF and to define how long it stays on for (5, 10, 20, 30, or 60 seconds).

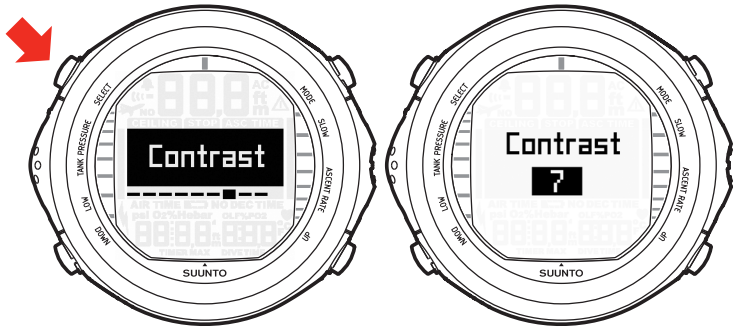
NOTE *When the backlight is turned OFF, it does not illuminate when an alarm sounds.*



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

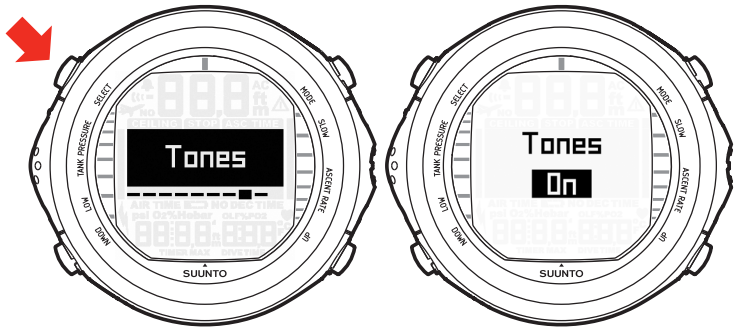
4.1.7. Setting the contrast

In the Contrast setting mode, you are able to set the contrast of the display (the value range is between 0 and 10).



4.1.8. Setting the tones

In the Tones setting mode, you are able to activate or deactivate the tones.

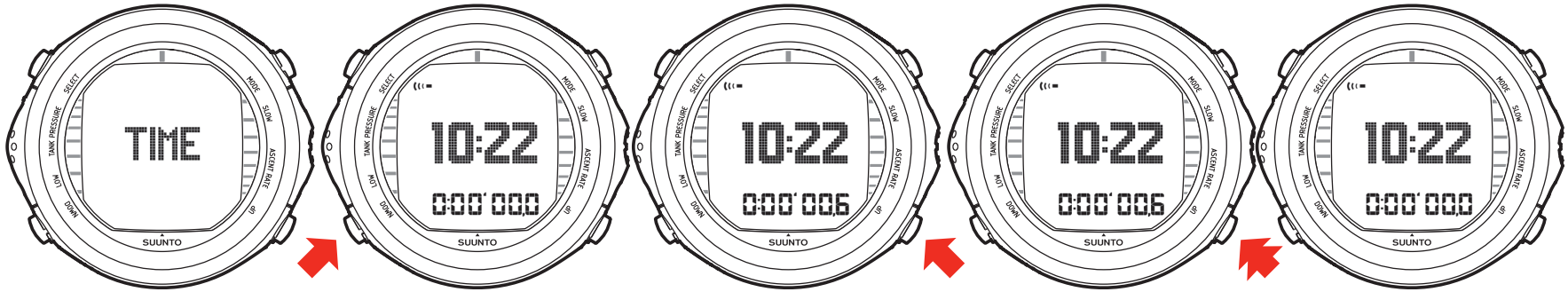


NOTE *When the tones are off, there are no audible alarms.*

4.2. Stopwatch

The Stopwatch function in Suunto DX measures elapsed and split times.

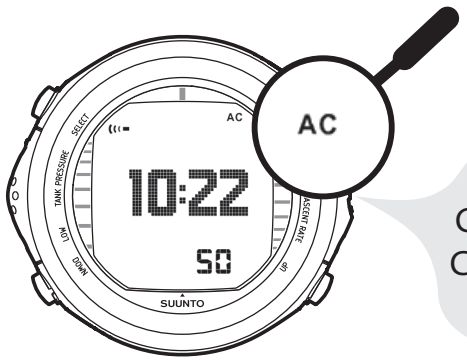
A separate stopwatch (dive timer) can also be used in the DIVE mode. For more information, refer to *Section 6.1.6. Stopwatch (Timer)*.



USE DOWN BUTTON TO START STOPWATCH AND TAKE A SPLIT TIME. THE UP BUTTON STOPS THE STOPWATCH. IF YOU HAVE TAKEN SPLIT TIMES, YOU CAN SCROLL THEM BY SHORT PRESSING THE UP BUTTON. LONG PRESSING UP RESETS THE STOPWATCH.

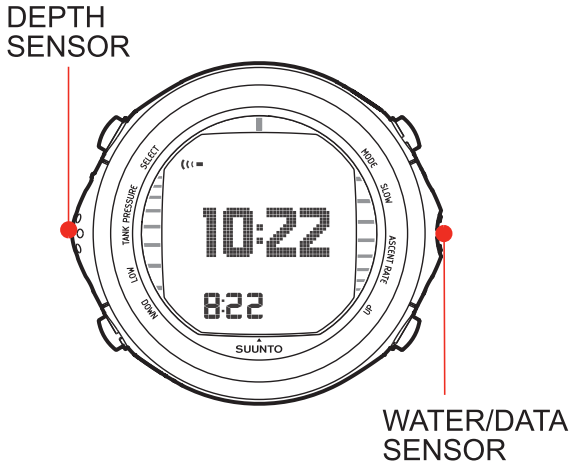
4.3. AC water contacts

The water and data transfer contact is located on the side of the case. When submerged, the water contact poles are connected by the conductivity of the water and the “AC” symbol appears on the display. The AC text is shown until the water contact deactivates.



AC APPEARS IN THE TOP RIGHT CORNER OF THE DISPLAY, WHEN THE DIVE COMPUTER IS IN CONTACT WITH WATER. THIS ALSO ACTIVATES THE DIVE MODE.

Contamination or dirt on the water contact may prevent this automatic activation. Therefore, it is important that the water contact is kept clean. The contact can be cleaned with fresh water and a soft brush, for example a tooth brush.

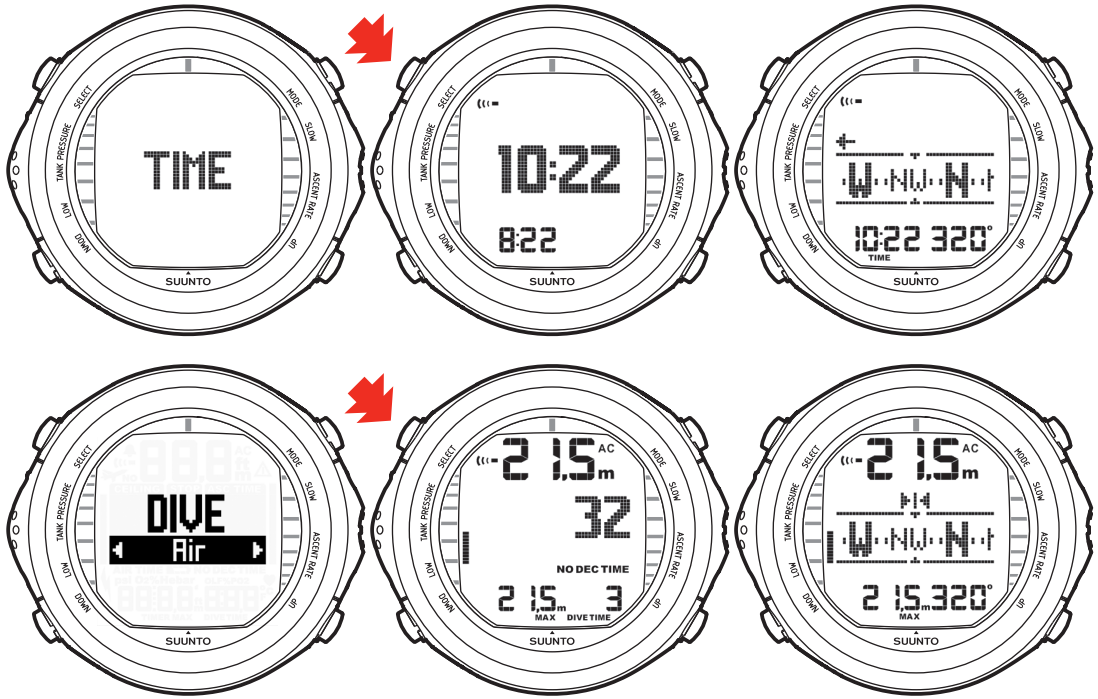


NOTE

Water or moisture build-up around the water contact may cause the contact to activate automatically. This can happen, for example, when washing your hands or sweating. If the water contact activates in the TIME mode, the AC symbol will appear on the display, and will be shown until the water contact deactivates. To save battery power, you should deactivate the water contact by cleaning it and/or drying it with a soft towel.

4.4. Learning how to use your compass

Suunto DX integrates a digital compass that can be used both while diving and and on the surface, and can be accessed by long-pressing the SELECT button.



IF ACCESSED FROM TIME MODE, TIME AND BEARING ARE DISPLAYED AT THE BOTTOM OF THE SCREEN.

ACCESSED FROM DIVE MODE, CURRENT DEPTH, AND TIME OR MAXIMUM DEPTH, TANK PRESSURE, AS WELL AS BEARING OR DIVE TIME OR TEMPERATURE ARE DISPLAYED.

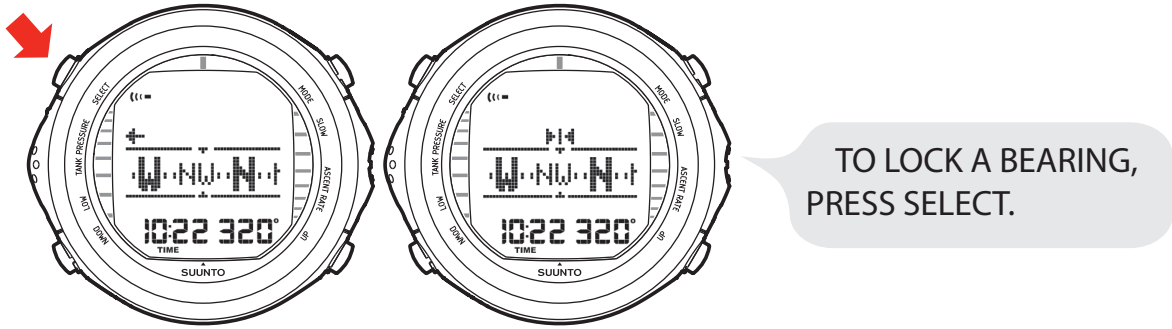
NOTE *When accessed from DIVE mode, toggle between the alternative displays by pressing the UP/DOWN buttons.*

4.4.1. Compass display

The Suunto DX displays the compass as a graphical representation of a compass rose. The rose displays the cardinal and half cardinal points, in addition to which, the current bearing is also displayed numerically.

4.4.2. Locking a bearing

A bearing can be locked to help you follow a selected course, and directional arrows point towards the locked bearing. The last locked bearing is stored and is available the next time the compass is activated. In the DIVE mode the locked bearings are also stored in the log.



The Suunto DX also provides help for navigating square and triangular patterns, as well as navigating a return heading. This is made possible by following graphical symbols in the center of the compass display:

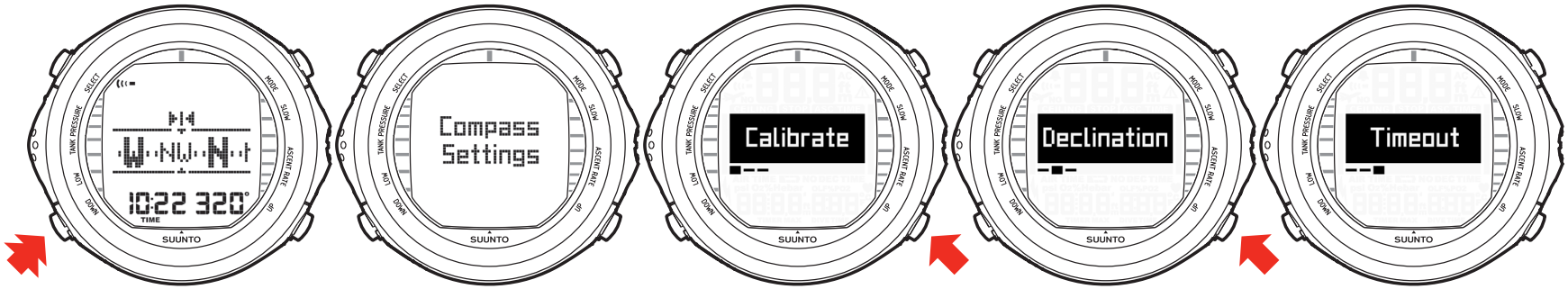
Table 4.1. Locked bearing symbols

Symbol	Explanation
	You are traveling towards the locked bearing
	You are 90 (or 270) degrees from the locked bearing

Symbol	Explanation
	You are 180 degrees from the locked bearing
	You are 120 (or 240) degrees from the locked bearing

4.4.3. Compass settings

You can define the compass settings (Calibration, Declination and Timeout) in the COMPASS mode:



Calibration

Because of changes in the surrounding magnetic field, the Suunto DX electronic compass occasionally needs to be re-calibrated. During the calibration process, the compass adjusts itself to the surrounding magnetic field . As a basic rule, you should calibrate the compass whenever it does not seem to operate properly, or after replacing the dive computer's battery.

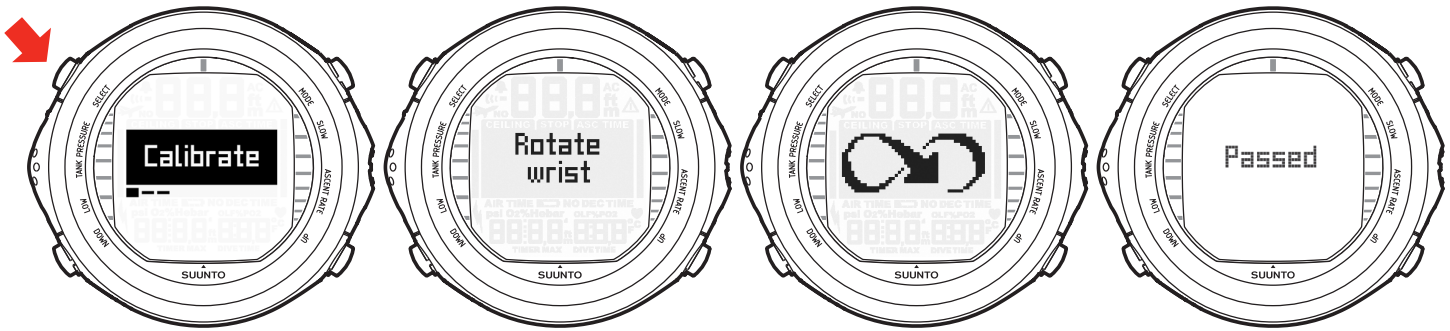
NOTE *The unit will automatically enter the calibration sequence when taken into use for the first time.*

Strong electromagnetic fields, such as power lines, stereo speakers, and magnets can affect the compass calibration. Therefore, it is advisable to calibrate the compass if your Suunto DX has been exposed to these fields.

NOTE *When traveling overseas, it is recommended that you recalibrate the compass at the new location before using it.*

NOTE *Remember to hold the Suunto DX level during the calibration process.*

To calibrate the compass:

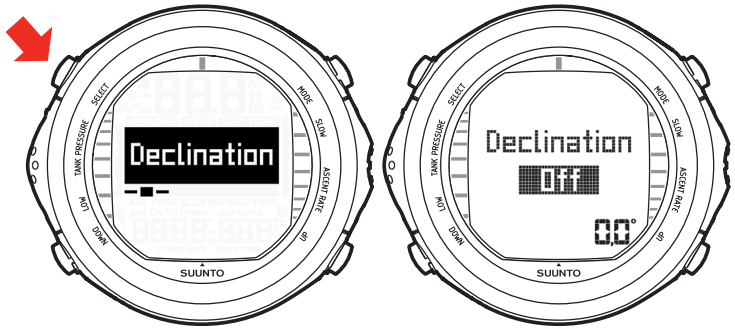


HOLD THE DEVICE LEVEL AND SLOWLY ROTATE THE UNIT IN A LARGE "INFINITY LOOP" UNTIL THE DEVICE BEEPS AND TEXT PASSED APPEARS.

If the calibration fails several times in a row (text “Try Again” appears), it is possible that you are in an area with sources of magnetism, such as large metal objects, power lines or electric appliances. Move to another location and try to calibrate the compass again. If the calibration continues to fail, contact an authorized Suunto service center.

Declination

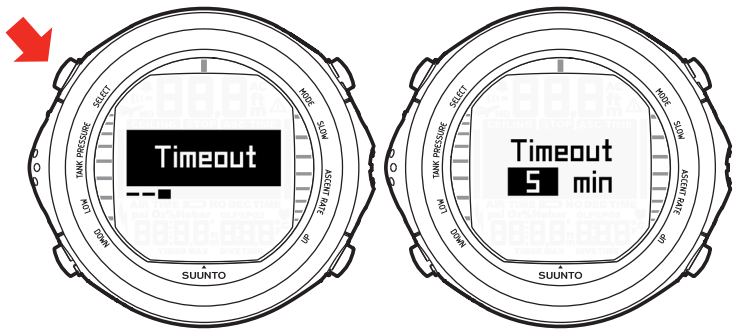
You can compensate for the difference between true north and magnetic north by adjusting the compass declination. The declination can be found, for example, from sea charts or topographic maps of the local area.



ADJUST WITH UP AND DOWN. ACCEPT WITH SELECT.

Time-out

You can set the compass time-out minutes. After the set time has passed from the latest button press, the dive computer returns to the TIME or DIVE mode from the COMPASS mode.



ADJUST WITH UP AND DOWN. ACCEPT WITH SELECT.

You can exit the COMPASS mode also by long pressing the SELECT button.

5. BEFORE DIVING

Do not attempt to use the dive computer without reading this user's guide in its entirety, including all the warnings. Make sure that you fully understand the use, displays and limitations of the instrument. If you have any questions about the manual or the dive computer, contact your SUUNTO dealer before diving with the dive computer.

Always remember that YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY!

When used properly, Suunto DX is an outstanding tool for assisting properly trained, certified divers in planning and executing sport dives. It is NOT A SUBSTITUTE FOR CERTIFIED SCUBA INSTRUCTION, including training in the principles of decompression.

⚠ WARNING *Diving with gas mixtures exposes you to risks that are different from those associated with diving with standard air. These risks are not obvious, and require training to understand and avoid. Risks include possible serious injury or death.*

Do not attempt to dive with any gas mix other than standard air without first receiving certified training in this specialty.

5.1. The Suunto Fused™ RGBM

Suunto Fused RGBM is an expanded version of the Suunto Technical RGBM. It additionally incorporates Dr. Bruce Wienke's FullRGBM, which is the most complete bubble model in existence today. As the FullRGBM developed by Dr. Wienke is intended only for deep decompression dives, the Suunto Fused RGBM utilizes Suunto Technical RGBM for <40m dives. Suunto Fused RGBM can thus adapt equally well to both recreational and technical diving, and it is also suitable for diving on rebreathers. Functionality of Suunto Fused RGBM has been validated and verified to the depth of 150 m / 491 ft.

The Suunto DX uses traditional recommended safety stops as well as deep stops.

In order to optimize the response to different increased risk situations, an additional category of stop, referred to as a Mandatory Safety Stop, has been introduced. The combination of stop types depends on the user settings and the specific dive situation.

5.2. Emergency ascents

If you dive no deco using only air or nitrox, follow these steps:

1. Assess the situation calmly and then move promptly to less than 18 m/60 ft.
2. At 18 m/60 ft, slow down your ascent rate to 10 m/33 ft per minute and move to a depth between 3 and 6 m/10 and 20 ft.
3. Stay there for as long as your air supply will safely allow. After reaching the surface, do not dive for at least 24 hours.

For technical dives, you must have the dive plan created and available on the dive e.g., on a slate. You must also have a back-up plan for lost gases. In the unlikely event that the dive computer malfunctions during a dive, start using an alternative depth gauge and timer and following the ascent schedule and gas switches that are on your slate.

5.3. Dive computer limitations

While the dive computer is based on current decompression research and technology, you must realize that the computer cannot monitor the actual physiological functions of an individual diver. All decompression schedules currently known to the authors, including the U.S. Navy Tables, are based on theoretical mathematical models, which are intended to serve as a guide to reduce the probability of decompression sickness.

5.4. Audible and visual alarms

The dive computer has audible and visual alarms that advise when important limits are approached or that prompt you to acknowledge preset alarms. The table below describes the different alarms and their meanings.

Table 5.1. Dive computer alarms

Alarm type	Sound pattern	Duration
High priority		2.4 s sound + 2.4 s break
Low priority		0.8 s sound + 3.2 s break

Table 5.2.

Instructional beep	Sound pattern	Interpretation
Ascending		Start ascending
Descending		Start descending
Descending-ascending		Change gas

The **visual information** on the dive computer display is shown during the alarm breaks in order to save battery.

Table 5.3. Audible and visual alarm types

Alarm type	Alarm reason
High priority alarm followed by "Start ascending" beep, repeated for the maximum of three minutes. The **PO_2** value blinks.	PO_2 value is greater than the adjusted value. Current depth is too deep for the gas in use. You should immediately ascend or change to a gas with a lower oxygen percentage.

Alarm type	Alarm reason
High priority alarm followed by "Change gas" beep, sounded two times. The **PO_2** value blinks.	PO_2 value is smaller than 0.18 bar. In **DIVE Mixed and DIVE CCR** modes only. The depth is too shallow and the ambient pressure is too low for the current gas. The oxygen content is too low to keep you conscious. You should immediately switch the gas.
High priority alarm followed by "Start descending" beep, repeated for the maximum of three minutes. The **Er** symbol blinks and an arrow points downwards.	Decompression ceiling depth is exceeded. You should immediately descend to, or below, the ceiling
High priority alarm, sounded three times. The **SLOW** symbol blinks.	Maximum allowed ascent rate, 10 m per min / 33 ft per min, is exceeded. Slow the ascend rate down.
Low priority alarm followed by "Start ascending" beep, sounded two times. The **ASC TIME** symbol blinks and an arrow points upwards.	No-decompression dive turns into a decompression stop dive. Depth is below the decompression floor level. You should ascend to, or above, the floor.

Alarm type	Alarm reason
Low priority alarm followed by "Change gas" beep, sounded once. The Gas mix value **(O_2%, O_2%|He%)** blinks.	Gas change is recommended. In **DIVE Mixed and DIVE CCR** modes only. You should change to a gas more favorable to decompression. ASC TIME assumes that the gas is changed and is accurate only if you change the gas accordingly.
Low priority alarm followed by "Change gas" beep, sounded once. The backlight is lit and text "Set Point selected" is displayed shortly.	Notification sound that the set point has been switched automatically upon reaching the defined depth. In **DIVE CCR** mode only.
Low priority alarm followed by "Start descending" beep, for the duration of the Deep Stop violation. The **DEEPSTOP** symbol blinks and an arrow points downwards.	Mandatory Deep Stop is violated. You should descend to complete the Deep Stop.
Low priority alarm followed by two short beeps, sounded once. The **DEEPSTOP** and timer symbols are displayed.	The Deep Stop depth is reached. Make the Mandatory Deep Stop for the duration shown by the timer.

Alarm type	Alarm reason
Low priority alarm, sounded two times. The **Tank pressure** symbol blinks.	Cylinder pressure reaches the selected alarm pressure, 10 - 200 bar. Cylinder pressure reaches the fixed alarm pressure, 50 bar. This alarm operates only if the pairing to the wireless tank pressure transmitter is performed correctly and the transmission of tank pressure data is not disrupted during the dive for any reason. You can acknowledge the alarm.
Low priority alarm, sounded two times. The **OLF%** value blinks if the PO_2 value is greater than 0.5 bar.	The OLF value reaches the fixed 80% or 100%. In **DIVE Mixed and DIVE CCR** modes only. You can acknowledge the alarm.
Low priority alarm, sounded two times. The **Maximum depth** value blinks.	The selected depth (3–120 m / 10–394 ft) is exceeded. The fixed maximum depth (120 m / 394 ft) is exceeded. You can acknowledge the alarm.
Low priority alarm, sounded two times. The **Dive time** value blinks.	The selected dive time (1–999 min) is exceeded. You can acknowledge the alarm.

NOTE *When the backlight is turned OFF, it does not illuminate when an alarm is activated.*

NOTE *When the tones are turned OFF, the alarms are not sounded when an alarm is activated.*

WARNING *WHEN THE OXYGEN LIMIT FRACTION INDICATES THAT THE MAXIMUM LIMIT IS REACHED, YOU MUST IMMEDIATELY TAKE ACTION TO REDUCE OXYGEN EXPOSURE. Failure to take action to reduce oxygen exposure after the warning is given can rapidly increase the risk of oxygen toxicity, injury, or death.*

5.5. Error conditions

The dive computer has warning indicators that alert you to react to certain situations that would significantly increase the risk of DCS. If you do not respond to its warnings, the dive computer will enter an Error mode, indicating that the risk of DCS has greatly increased. If you understand the dive computer and operate it sensibly, it is very unlikely you will ever put the instrument into the Error mode.

Omitted decompression

The Error mode results from omitted decompression, for example, when you stay above the ceiling for more than three minutes. During this three-minute period the Er warning is shown and the audible alarm beeps. After this, the dive computer enters a permanent Error mode. The instrument will continue to function normally if you descend below the ceiling within this three-minute period.

When the dive computer is in the permanent Error mode, only the Er warning is shown in the center window. The dive computer does not show times for ascent or stops. However, all the other displays function as before to provide information for ascent. On an intended no-deco dive, you should immediately ascend to a depth of 3 to 6 m/10 to 20 ft and remain at this depth until air supply limitations require you to surface. On a planned deco dive you should utilize your back-up plan and proceed with the dive according to the plan, available gases allowing.

After surfacing, you should not dive for a minimum of 48 hours. During the permanent Error mode, the Er text is displayed in the center window and the planning mode is disabled.

5.6. Wireless transmission

In order to use the transmitter, the wireless integration needs to be enabled in your Suunto DX settings. To enable or disable the wireless integration, refer to *Section 5.8.5. Setting the tank pressure pairing*.

5.6.1. Installing the wireless transmitter

When purchasing the Suunto wireless transmitter, we strongly recommend that you have your Suunto representative attach the transmitter to the first stage of your regulator.

However, if you decide to attach it yourself, do the following:

1. Remove the high pressure (HP) port plug on the first stage of your regulator using an appropriate tool.

2. Thread the high pressure transmitter of the Suunto DX into the HP port of your regulator with your fingers. DO NOT OVERTIGHTEN! Maximum torque is 6 Nm/4.4 lbsft or 53 lbsin. The seal is based on a static O-ring, not force!
3. Attach the regulator to the scuba cylinder and slowly open the valve. Check for leaks by submerging the regulator first stage in water. If leaks are detected, check the condition of the O-ring and sealing surfaces.

5.6.2. Pairing and code selection

In order to receive wireless data, the transmitter and the Suunto DX need to be paired. During the pairing procedure, the dive computer locks on the code that the transmitter has.

The transmitter is activated when the pressure exceeds 15 bar/300 psi and it then starts sending pressure data together with a code number. During the pairing procedure, the Suunto dive computer stores the code number and starts displaying pressure values that are received with that code. This coding procedure prevents data mix-up from other divers also using a Suunto wireless transmitter.

When there is no stored code, the Suunto DX displays “cd:--” and receives data with lowered sensitivity from a very short distance only (0.1–0.5m / 0.5–1 ft). The flash symbol is not displayed at this phase. By taking the Suunto DX unit close to the transmitter, it will store the received code and start receiving with full sensitivity and display data received with this code only.

NOTE *The pairing procedure only needs to be performed once, before the first use. You do not need to redo the pairing unless you change the transmitter to a new one, or another diver in your group uses the same code as you.*

To pair the transmitter and the Suunto DX dive computer:

1. Ensure that the transmitter is properly attached to the regulator's HP port and that the regulator is properly attached to the cylinder.
2. Ensure that the Suunto DX is turned on, and that the wireless integration is enabled in the Suunto DX settings (Tank Press is set ON. For more information, refer to *Section 5.8.5. Setting the tank pressure pairing*). If the Suunto DX is in the TIME mode, enter the DIVE mode by short-pressing the MODE button. The DX should display "cd:--" in the lower left corner of the display.
3. Slowly open the cylinder valve fully and pressurize the system. The transmitter starts transmitting when the pressure exceeds 15 bar/300 psi.
4. Take the Suunto DX unit close to the transmitter. The unit will then quickly display the selected code number and then start displaying the transmitted cylinder pressure. The wireless transmitter indicator (blinking flash symbol) is displayed every time the Suunto DX receives a valid signal.

⚠ WARNING *If there are several divers using a Suunto wireless transmitter, always ensure that each diver is using a different code before starting the dive.*

In case there are several divers using the same code, the transmitter's code must be changed before diving.

To assign a new transmitter code:

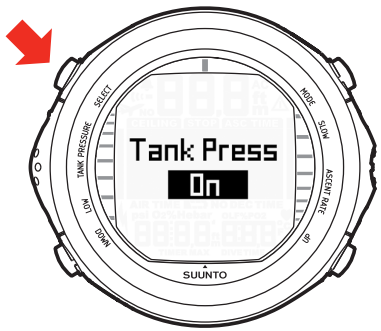
1. Slowly open the cylinder valve fully to pressurize the system.
2. Immediately close the tank valve, and quickly depressurize the regulator so that the pressure is reduced to less than 10 bar/145 psi. Wait about 10 seconds, and slowly open the cylinder valve again to re-pressurize to above 15 bar/300 psi.

The transmitter assigns a new code automatically.

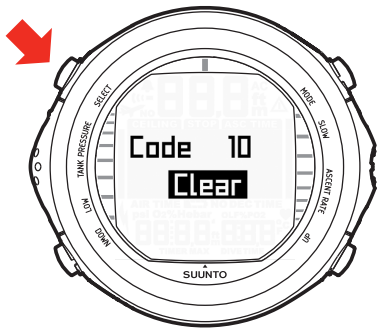
NOTE *To pair on the new transmitter code, the Suunto DX code must be cleared first.*

To re-pair the transmitter with the new code and the Suunto DX dive computer:

1. In the DIVE mode of the Suunto DX, long-press the DOWN button to enter the DIVE settings. Enter the Tank Press Pairing menu (Refer to *Section 5.8.5. Setting the tank pressure pairing*). Short-press the SELECT button to bypass the tank pressure ON/OFF selection (the tank pressure transmission must remain ON).



2. In the next menu, a Code number is displayed. Clear the code by short-pressing the UP button (toggle from “Ok” to “Clear”), and press the SELECT button.



3. Short-press the MODE button to exit the DIVE settings.

4. Take the Suunto DX unit close to the transmitter (the system must be pressurized to above 15bar/300 psi). The dive computer displays the received new code number and then start displaying the transmitted cylinder pressure. The wireless transmitter indicator (flash symbol) is displayed every time the Suunto DX receives a valid signal.

NOTE *In order to save battery energy, the transmitter enters power saving mode with slower data transmission rate if the tank pressure remains unchanged for more than five (5) minutes. The transmitter continues transmitting with the saved code when any pressure change is detected (e.g., the user presses the purge button on regulator or breathes from the regulator).*

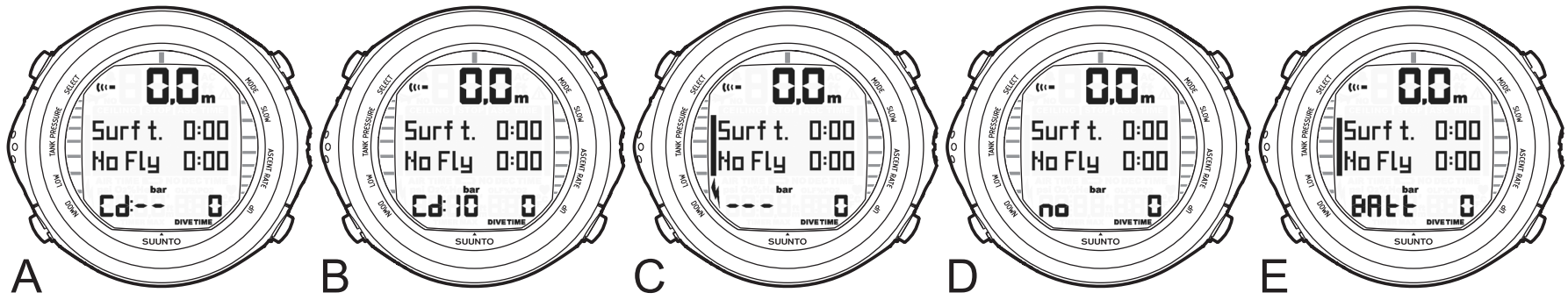
5.6.3. Transmitting data

After the pairing procedure, the Suunto DX will receive cylinder pressure data from the transmitter. The pressure is displayed in either bars or psi, depending on the unit selected. Any time the Suunto DX receives an appropriate signal, a flash symbol is displayed in the lower left corner.

Table 5.4. Pressure transmission related displays

Display	Indication	Figure
Cd:--	No code stored, the Suunto unit is ready for pairing with the transmitter.	A
Cd:10	Set Code. Code number can be between 01–40.	B

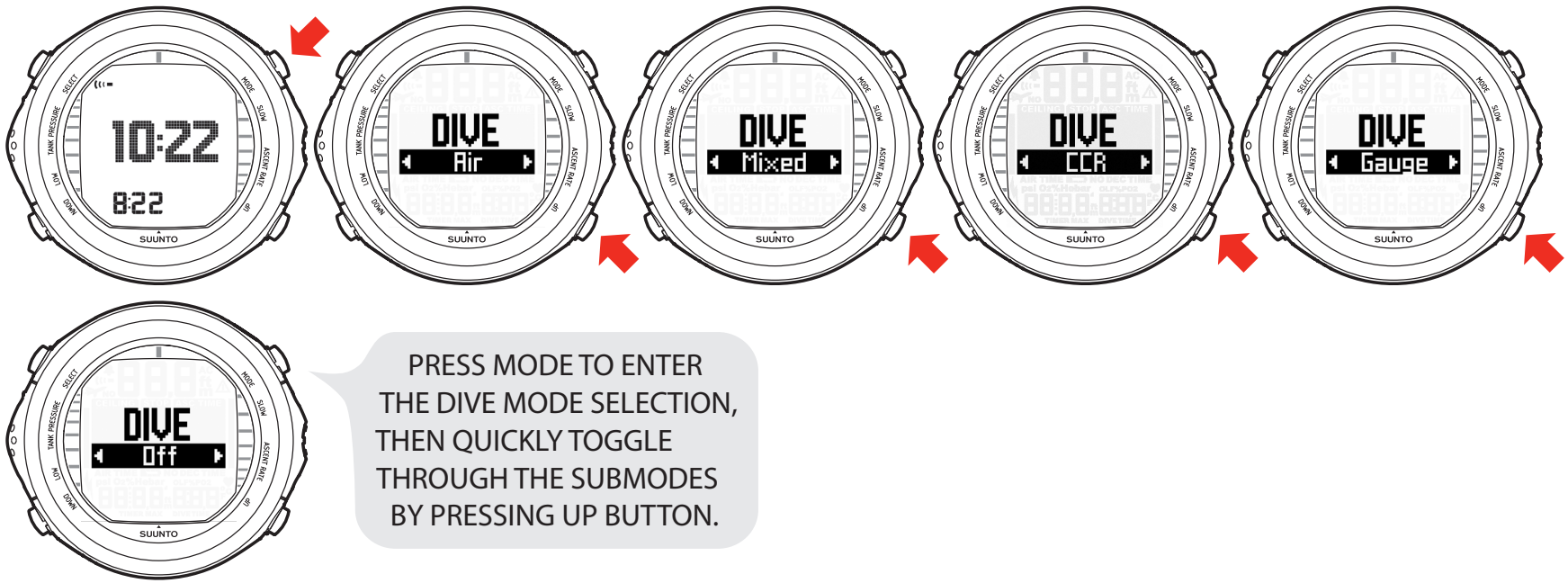
Display	Indication	Figure
- - -	The flash symbol is blinking. Pressure reading exceeds allowed limit (over 360 bar/5220 psi).	C
no conn	Text "no conn" is displayed when the unit receives no data packets from the transmitter. Pressure reading has not been updated for more than one minute. The latest valid pressure reading is displayed intermittently. The flash symbol is not displayed. Transmitter is out of range (>1.2 m/4 ft), in power saving mode or on another channel. Activate the transmitter by breathing off the regulator, and bring the D-series unit closer to the transmitter then check if the flash symbol appears. If not, clear the code on the Suunto D-series unit.	D
batt	Pressure transmitter battery voltage is low. The pressure reading is displayed intermittently. Change the transmitter battery!	E



5.7. Accessing DIVE mode

The Suunto DX has four diving modes: AIR mode for diving with standard air only, MIXED mode for diving with oxygen and/or helium mixtures, CCR for rebreather diving, and GAUGE mode for use as a bottom timer.

The chosen dive mode is displayed when the DIVE mode is accessed, and you can toggle between the submodes by pressing the UP/DOWN buttons.



5.8. DIVE mode settings

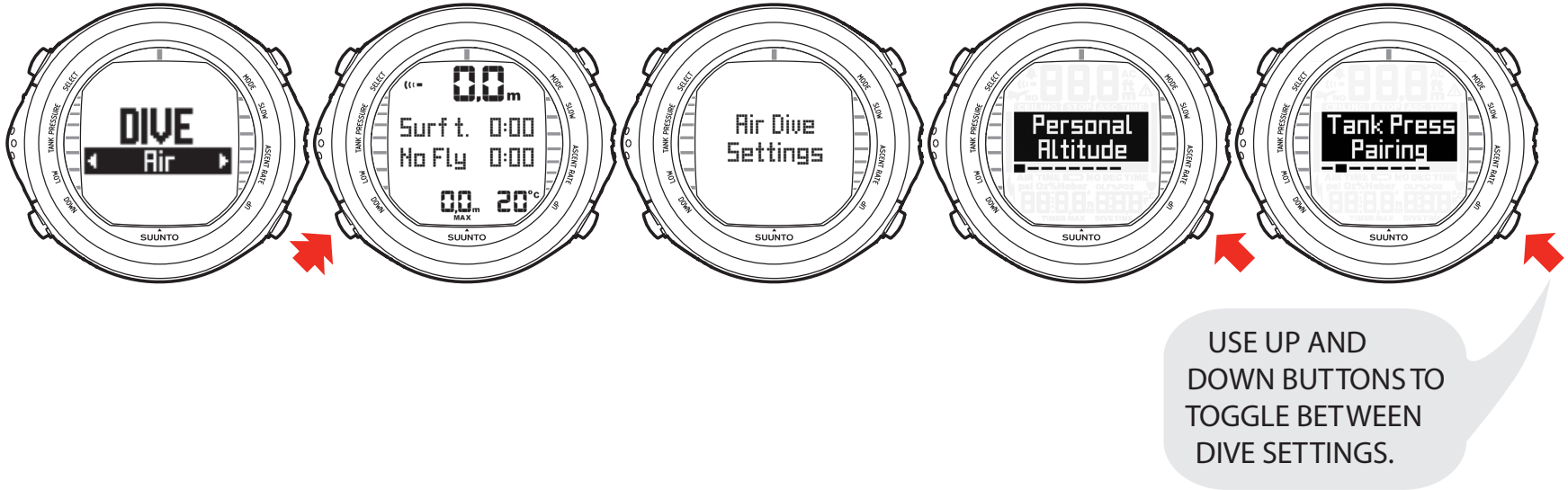
Suunto DX has several user-definable functions, as well as depth and time-related alarms that you can set according to your personal preferences. The DIVE mode settings are dependent on the dive submode chosen (AIR, MIXED, CCR, GAUGE), so that, for example, Set point settings are only available in the CCR submode.

The table below shows what DIVE settings are available in each DIVE submode.

Table 5.5. DIVE mode settings

Setting	**AIR mode**	**MIXED mode**	**CCR mode**	**GAUGE mode**
CC gases			X	
OC gases		X	X	
Set Point			X	
Personal/Altitude	X	X	X	
Tank pressure pairing	X	X	X	X
Tank pressure alarm	X	X	X	X
Depth alarm	X	X	X	X
Dive time alarm	X	X	X	X
Sample rate	X	X	X	X
Deep stop	X			
Air time	X	X		

The figure below shows how to enter the DIVE mode settings menu.

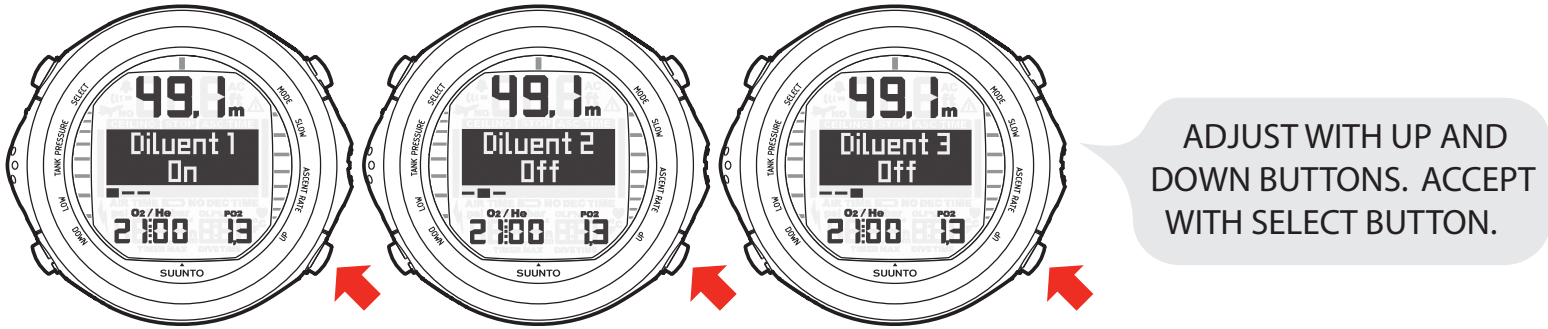


NOTE *Some settings cannot be changed until five (5) minutes has elapsed after the dive.*

5.8.1. Setting the CC gases

If set to the DIVE CCR mode, the correct oxygen and helium percentages of the diluent gas(es) in your diluent cylinder(s) must always be entered into the dive computer to ensure correct tissue and oxygen calculation. The Set Point mode is used for setting the high and low oxygen partial pressure values.

When in the CCR CC Gases setting mode, the equivalent maximum operating depth, based on the chosen setting, is also be displayed.

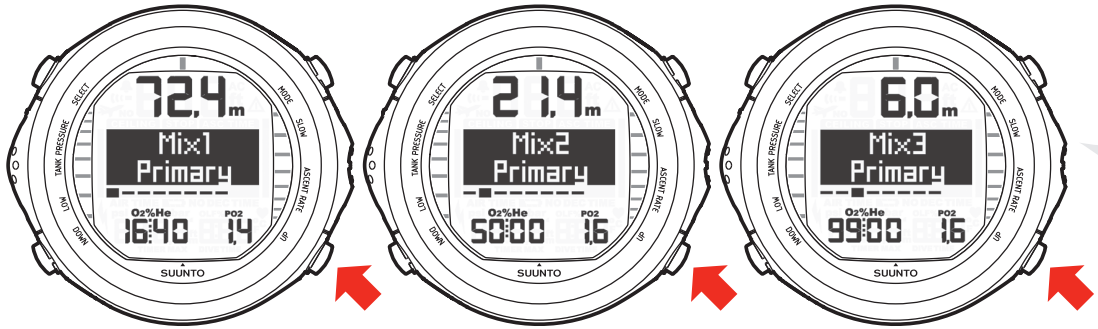


After entering values for Diluent 1, you can set additional diluents, Diluent 2 and Diluent 3, similarly. You can set these to “ON” or “OFF”. Diluent 1 is always set as an “ON” gas whereas Diluent 2 and Diluent 3 are “OFF” by default.

⚠ WARNING *Only enable the diluent(s) you actually have available and remember to check the set values before every dive to ensure they are correct.*

5.8.2. Setting the open-circuit gases

If set to the DIVE MIXED or DIVE CCR mode, the correct oxygen and helium percentages of the open-circuit gas(es) in all your cylinders (and additional gases) must always be entered into the dive computer to ensure correct tissue and oxygen calculation. In addition, the oxygen partial pressure limit must be set.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

When in the MIXED or CCR OC Gases setting mode, the equivalent maximum operating depth, based on the chosen setting, is also be displayed.

After entering values for Mix1, you can set additional mixes, Mix2–Mix8, similarly. You can set them to "PRIMARY", "SECONDARY" or "OFF". Mix1 is always set as a primary gas.

In order to minimize the risk of error during a dive, it is highly recommended that the mixes are set in the proper order. This means that as the mix number rises, so does oxygen content, and this is the order they are usually used during the dive. Before a dive, only enable the mixes you actually have available and remember to check the set values to ensure they are correct.

The ASC time is calculated based on the assumption that you start the ascent profile immediately and all the PRIMARY gases are changed as soon as their maximum operating depth allows it. That is, using the gases that are set as primary, the most optimal ascent schedule for the moment is calculated.

To see the most pessimistic ascent schedule, that is, a schedule for the situation when gases are not changed at all, you can set the gases as SECONDARY and the time it takes to finish the decompression using the current breathing gas is shown as the ASC time.

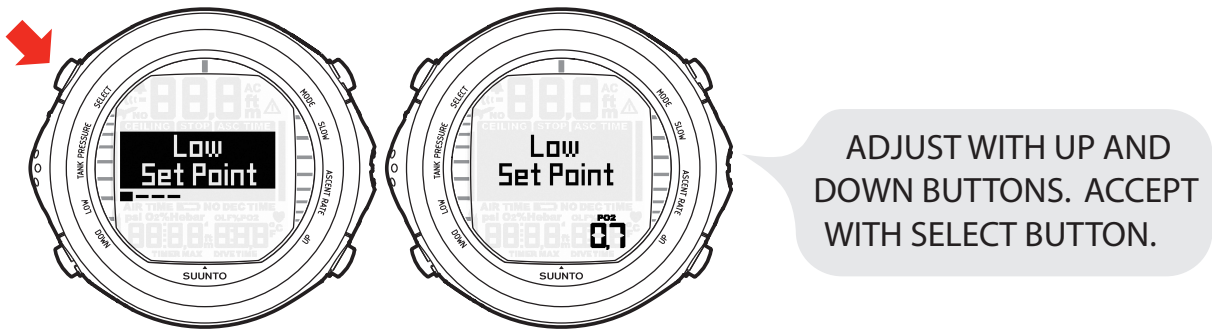
Showing the most pessimistic ascent schedule during a long dive can easily result in the ascent time no longer fitting the reserved field and the dive computer displays "---" (max. 999 min).

NOTE *While setting the gases, notice that the calculated maximum operating depth is displayed in the upper field. You cannot change to this gas before you have ascended above this depth.*

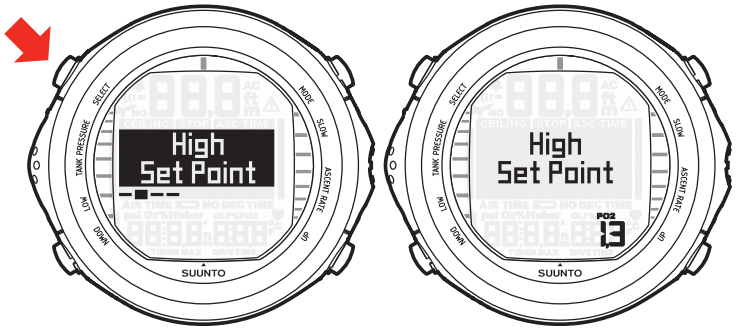
In MIXED and CCR OC Gases mode, the default oxygen percentage (O_2%) setting is 21% (air) and oxygen partial pressure (PO_2) setting 1.4 bar.

5.8.3. Setting the Set Point values

In DIVE CCR mode you'll use Set Point menu for adjusting your Low/High Set Point PO_2 value and Switch High/Low depth.

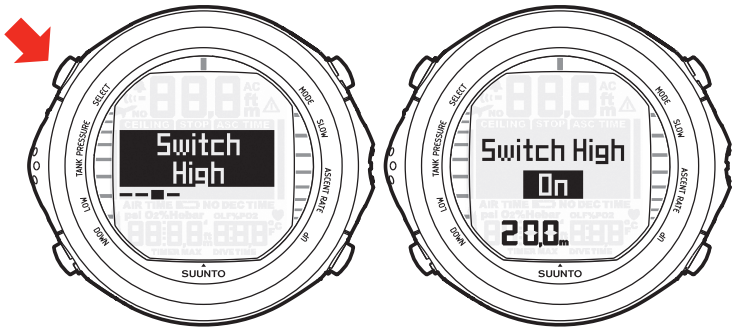


The default setting for Low Set Point is PO_2 0.7 bar (range 0.4-0.9 bar).



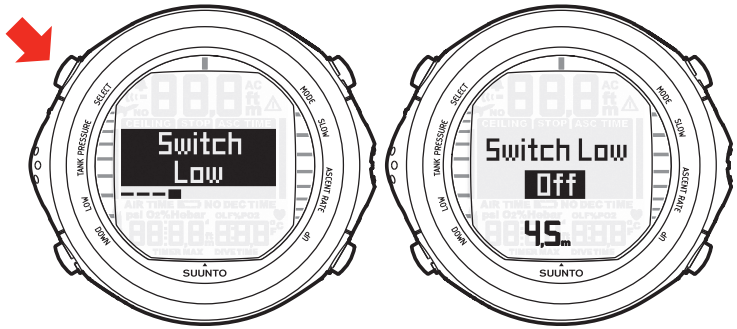
ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

The default setting for High Set Point is PO_2 1.3 bar (range 1.0-1.5 bar).



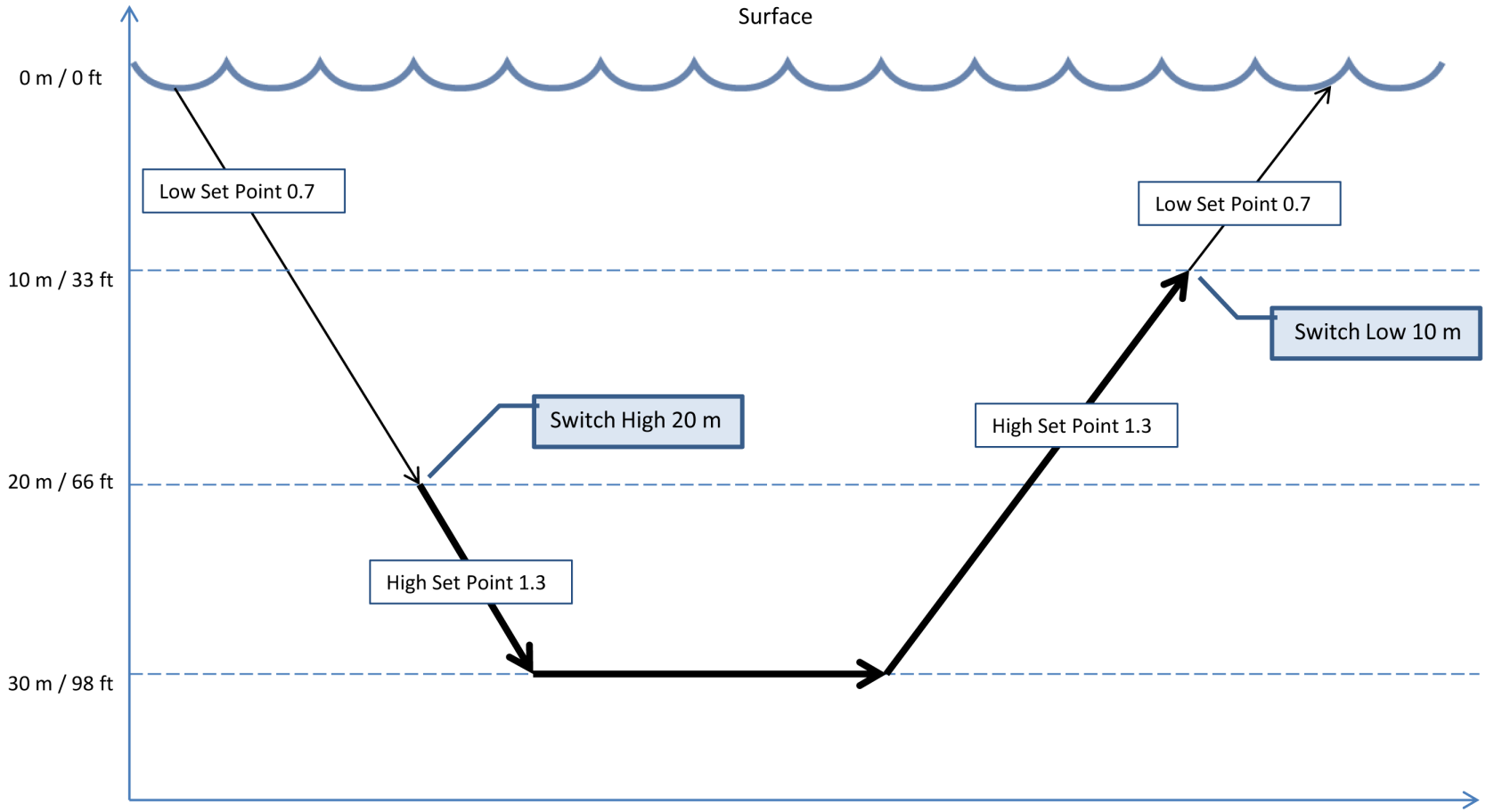
ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

Switch High depth can be set ON or OFF. ON means automatic switch to high set point at the defined depth, OFF means manual set point switching. The default setting for Switch High is ON, 20.0 m / 70 ft (range 15.0-60.0m / 50-200 ft).



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

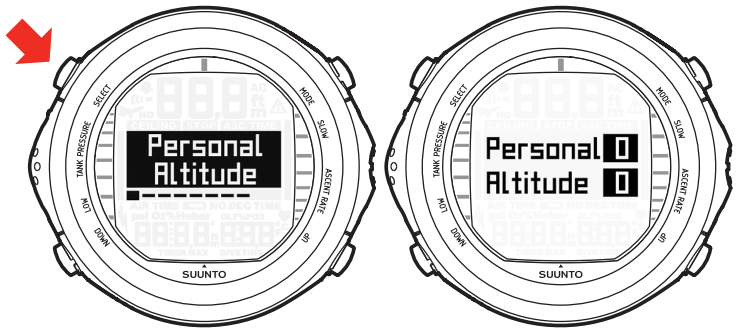
Switch Low depth can be set ON or OFF. ON means automatic switch to low set point at the defined depth, OFF means manual set point switching. The default setting for Switch Low is OFF, 4.5 m / 15 ft (range 3.0-15.0 m / 10-50 ft).


Surface
0 m / 0 ft
10 m / 33 ft
20 m / 66 ft
30 m / 98 ft
Low Set Point 0.7
Switch High 20 m
High Set Point 1.3
High Set Point 1.3
Low Set Point 0.7
Switch Low 10 m

The picture above illustrates a CCR dive using set points (Low Set Point 0.7 / High Set Point 1.3) and automatic high (Switch High ON 20 m) and low (Switch Low ON 10 m) set point switching. For shallow water (<6m/ 20 ft) decompression the Switch Low can be turned OFF.

5.8.4. Setting the personal/altitude adjustments

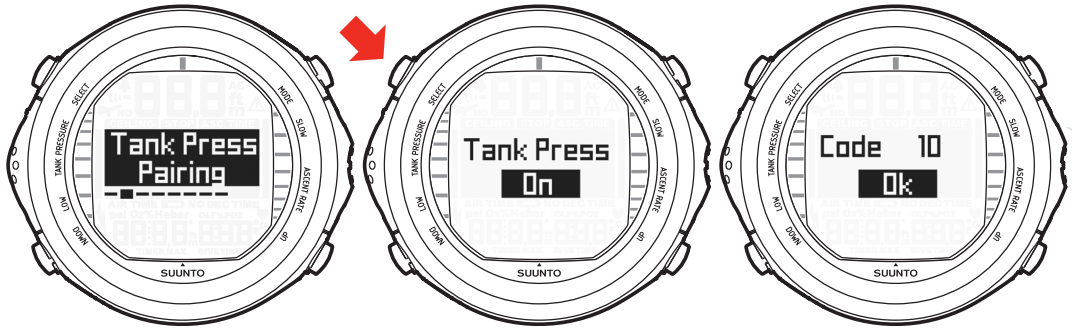
The current Altitude and Personal Adjustment settings are displayed in the startup screen when entering the DIVE mode. If the mode does not match the altitude or personal conditions (refer to *Section 5.10.3. Diving at altitude* and *Section 5.10.4. Personal adjustments*), it is imperative that you enter the correct selection before diving. Use Altitude Adjustment to select the correct altitude and use Personal Adjustment to add an extra level of conservatism.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.5. Setting the tank pressure pairing

In the Tank Pressure Pairing setting mode, the wireless transmission can be set “ON” or “OFF” depending on whether the wireless pressure transmitter is used or not. When the wireless transmission is set “OFF”, no cylinder pressure-related data is shown, nor data reception made. The Code setting allows you to verify the selected transmitter code and to clear the stored transmitter code. Clearing the code enables re-pairing with the transmitter, which can be necessary if a new transmitter or used, or if several divers are using the same transmitter code.

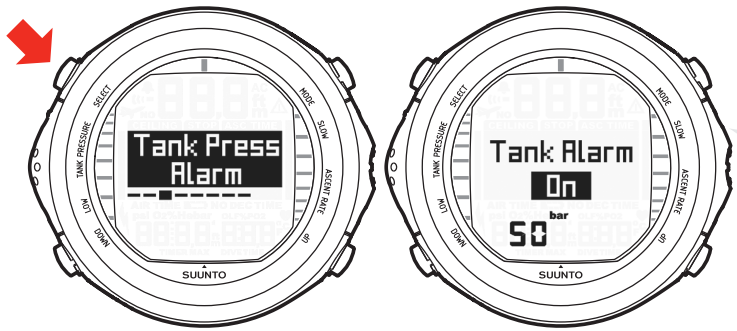


ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.6. Setting the tank pressure alarm

The tank pressure alarm can be set "ON" or "OFF" and in the range of 10–200 bar / 200-3000 psi. The alarm is the secondary cylinder pressure alarm point. The alarm is activated when the tank pressure drops below the set limit. You can acknowledge this alarm.

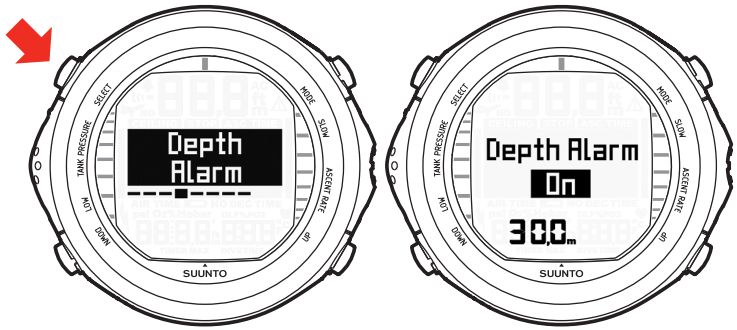
The 50 bar/700 psi alarm, however, is fixed and cannot be changed. You can acknowledge this alarm.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.7. Setting the depth alarm

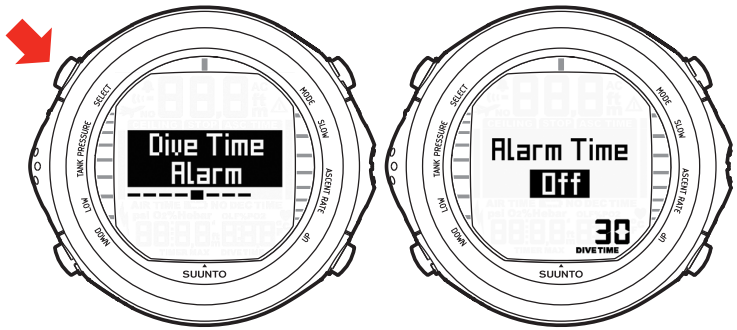
The Depth Alarm setting is factory-set to 30 m/100 ft, but you can adjust it according to your personal preference, or switch it off altogether. The depth range can be set from 3 m to 300 m/10 ft to 984 ft.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.8. Setting the dive-time alarm

The Dive Time Alarm setting can be activated and used for several purposes to add to your diving safety.



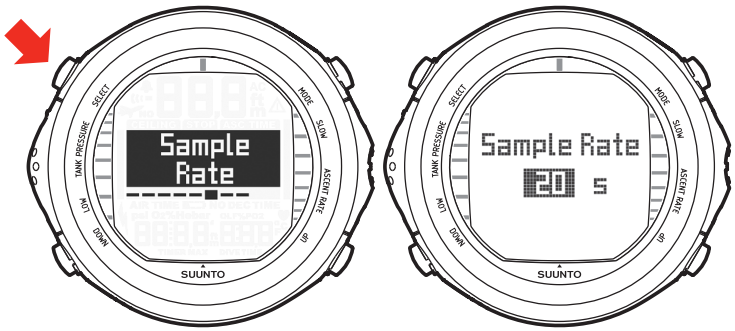
ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

NOTE *With a range of 1–999 minutes, the alarm can be set to your planned bottom time, for example.*

5.8.9. Setting the sample rate

The Sample Rate setting controls how often the depth, tank pressure (if enabled), and water temperature is stored in the memory.

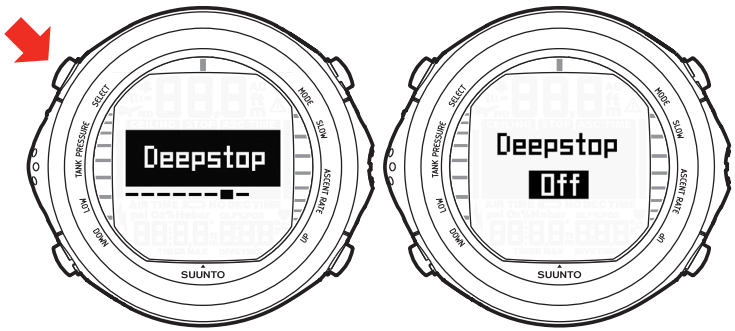
The factory default setting is 20 seconds (user selectable to 10, 20, 30, or 60 s).



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.10. Setting the deep stops

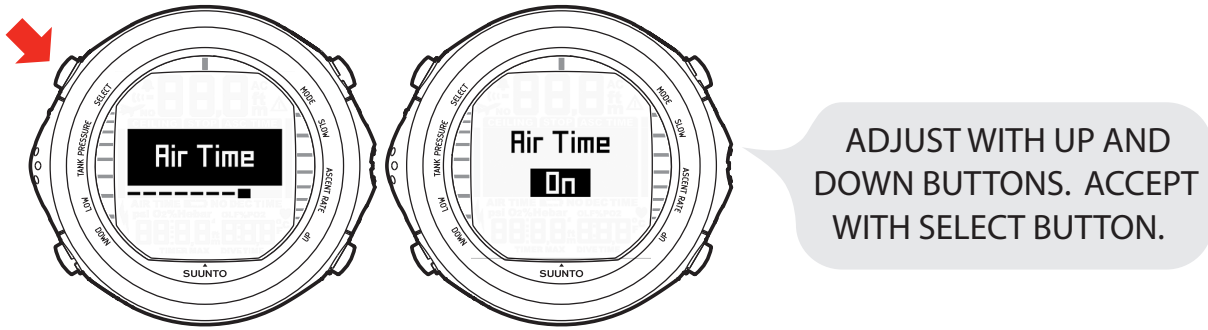
In the DIVE AIR mode in the Deep Stops setting mode, the Deep stops can be set “ON” or “OFF” depending on whether the Deep stops are used or not. In the MIXED and CCR mode(s) the Deep stops are always set ON.



ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

5.8.11. Setting the air time

In the Air Time setting mode, the remaining air time display can be set "ON" or "OFF" depending on whether estimated remaining air time display is used or not. Air Time can only be displayed when the wireless tank pressure transmitter is in use.



5.9. Before diving in the MIXED or CCR mode

If set to the MIXED or CCR mode, the correct oxygen and helium percentage of the gas in your cylinder(s) must always be entered into the computer to ensure correct inert gas and oxygen calculations. The dive computer adjusts its mathematical inert gas and oxygen calculation models accordingly. The dive computer will not accept fractional percentage values of oxygen and helium concentration. Do not round up fractional percentages. For example, 31.8% oxygen should be entered as 31%. If you want to adjust the computer to provide more conservative calculations, use the personal adjustment feature to affect decompression calculations, or reduce the PO_2 setting to affect oxygen exposure according to the entered O_2% and PO_2 values. Calculations based on nitrox use result in longer no-decompression times and shallower maximum depths than diving with air.

NOTE *As a safety precaution, the oxygen calculations in the dive computer are made with an oxygen percentage of 1% + set O_2%.*

When the dive computer is set in MIXED mode, the Dive Planning mode calculates using the O_2% and PO_2 values that are currently in the computer.

To set the nitrox, trimix and/or heliox mixes, refer to *Section 5.8.2. Setting the open-circuit gases*.

5.9.1. Default gas mix settings

In the MIXED and CCR mode, the Suunto DX allows you to set 1–8 open-circuit gas mixes containing 5–99% oxygen and 0–95% helium. In CCR mode the DX additionally allows up to three diluent gases.

In the MIXED and CCR mode, the default setting is standard air (21% O_2 and 0% He). It remains in this setting until the O_2% is adjusted to any other percentage of oxygen (5%–99%) or the He% is adjusted to any other percentage of helium (1–95%). In MIXED mode, the default setting for maximum oxygen partial pressure is 1.4 bar, however you are able to set it in the range of 0.5–1.6 bar. In CCR mode, you'll use the Set Point menu in CCR Dive Settings to define your high and low set points and switch depths.

5.10. Activation and pre-checks

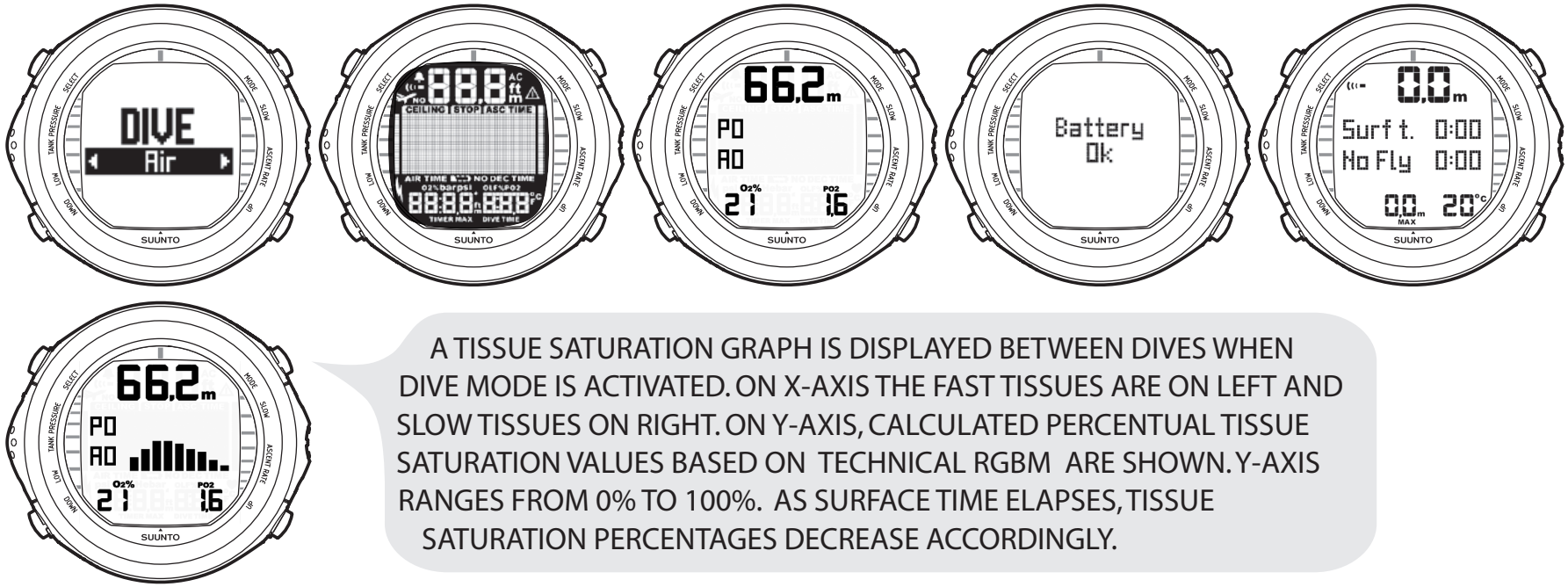
This section describes what happens when you activate the DIVE mode and explains the pre-checks that it is highly recommended you perform before you get into the water.

5.10.1. DIVE mode activation

Unless the DIVE mode is set OFF, the dive computer activates automatically when submerged deeper than 0.5 m/1.5 ft. **However, it is necessary to activate the DIVE mode BEFORE diving to check the cylinder pressure, altitude and personal adjustment settings, battery condition, oxygen settings, and so on.**

After activation, all graphical display elements are turned ON, and the backlight and the beep are activated. After this, the selected altitude and personal settings are displayed along with the maximum operating depth (MOD), O_2% or O_2%/He and the PO_2 values. During a dive series (between two consecutive dives) the dive computer also displays the current tissue saturation graph. A few seconds later the battery power indicator is shown and the dive computer enters surface mode.

⚠ WARNING *SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS LIMIT THEIR MAXIMUM DEPTH TO 40 M /130 FT OR TO THE DEPTH CALCULATED BY THE COMPUTER BASED ON THE SELECTED O_2% AND A MAXIMUM PO_2 OF 1.4 BAR! Exposure to greater depths increases the risk of oxygen toxicity and decompression sickness.*



A TISSUE SATURATION GRAPH IS DISPLAYED BETWEEN DIVES WHEN DIVE MODE IS ACTIVATED. ON X-AXIS THE FAST TISSUES ARE ON LEFT AND SLOW TISSUES ON RIGHT. ON Y-AXIS, CALCULATED PERCENTUAL TISSUE SATURATION VALUES BASED ON TECHNICAL RGBM ARE SHOWN. Y-AXIS RANGES FROM 0% TO 100%. AS SURFACE TIME ELAPSES, TISSUE SATURATION PERCENTAGES DECREASE ACCORDINGLY.

At this time, perform your pre-checks, and ensure that:

- the instrument operates in the correct mode and provides a complete display (AIR/MIXED/CCR/GAUGE mode)
- the battery level is ok.
- the altitude, personal adjustment, Deep stops settings are correct.
- the instrument displays correct units of measurement (Metric/Imperial).
- the instrument displays the correct temperature and depth (0.0 m/0 ft).
- the alarm beeps.

If the optional wireless pressure transmitter is used ensure that:

- the pressure transmitter has been properly attached and the cylinder valve is open
- the transmitter and the wrist unit have been properly paired on a suitable code

- the pressure transmitter is working (flash symbol blinks, cylinder pressure is displayed), and that there is no low battery warning displayed
- you have enough air for your planned dive. You should also check the pressure reading against your back-up pressure gauge

And, if set to MIXED or CCR mode, ensure that:

- the correct number of mixes is set and that the oxygen and helium percentages are adjusted according to the measured gas blends in your cylinders
- the oxygen partial pressure limits are set correctly

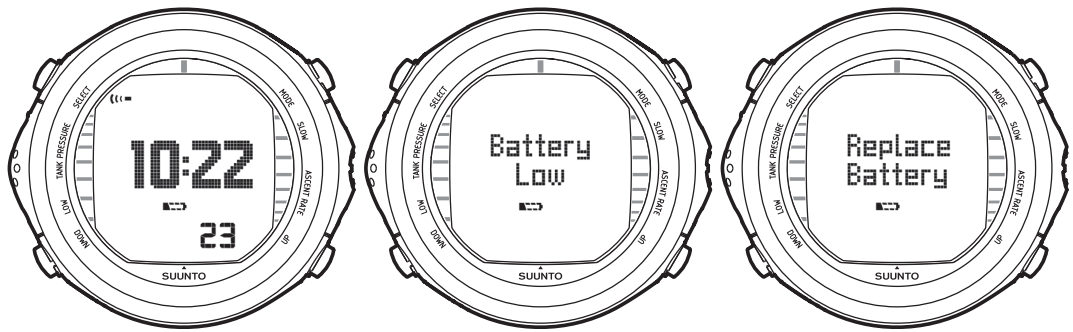
For more information on the MIXED and CCR modes, please refer to *Section 6.2. Diving in MIXED or CCR mode* .

The dive computer is now ready for diving.

5.10.2. Battery power indication

Temperature or internal oxidation of the battery affect the battery voltage. If the instrument is stored for a long period, or used in cold temperatures, the low battery warning may be displayed even though the battery has enough capacity. In these cases, re-enter DIVE mode to receive the battery power indication.

After the battery check, the low battery warning is indicated by the battery symbol.



If the battery symbol is displayed in the Surface mode, or if the display is faded or weak, the battery may be too low to operate the dive computer, and battery replacement is recommended.

NOTE *For safety reasons, the backlight cannot be activated when the low battery warning is indicated by the battery symbol.*

The optional wireless pressure transmitter sends out a low battery (batt) warning when its battery voltage is getting low. This is shown intermittently instead of the pressure reading. When you get this warning, the tank pressure transmitter's battery needs to be replaced.

5.10.3. Diving at altitude

The dive computer can be adjusted both for diving at altitude and also to increase the conservatism of the mathematical nitrogen model.

When programming the instrument for the correct altitude, you need to select the correct Altitude Adjustment settings according to *Table 5.6, Altitude Adjustment settings*. The dive computer will adjust its mathematical model according to the entered altitude setting, giving shorter no-decompression times at higher altitudes.

For more information, see *Section 10.2.2. Altitude diving*.

Table 5.6. Altitude Adjustment settings

Alt. adjustment value	**Altitude range**
A0	0–300 m / 0–1000 ft

Alt. adjustment value	Altitude range
A1	300–1500 m / 1000–5000 ft
A2	1500–3000 m / 5000–10 000 ft

NOTE *Section 5.8.4. Setting the personal/altitude adjustments describes how the Altitude value is set.*

WARNING *Traveling to a higher elevation can temporarily cause a change in the equilibrium of dissolved nitrogen in the body. It is recommended that you acclimatize to the new altitude by waiting at least three (3) hours before diving.*

5.10.4. Personal adjustments

There are personal factors that can affect your susceptibility to DCS, which you can predict in advance, and input into the decompression model. Such factors vary between divers and also for the same diver from one day to another. The five-step Personal Adjustment setting is available if a more conservative or aggressive dive plan is desired.

The personal factors which tend to increase the possibility of DCS include, but are not limited to:

- cold exposure —water temperature less than 20 °C/68 °F
- below average physical fitness level
- fatigue

- dehydration
- personal settings in AIR/MIXED/CCR mode
- previous history of DCS
- stress
- obesity
- patent foramen ovale (PFO)
- exercise on or after dive

This feature is used to adjust the computer to be more conservative, according to personal preference, by entering the suitable Personal Adjustment setting with the help of *Table 5.7, Personal Adjustment settings*. In ideal conditions, retain the default setting, P0. If conditions are more difficult, or any of the factors which tend to increase the possibility of DCS exist, select P1, or even the most conservative P2. For very experienced divers willing to take high personal risks and full responsibility of their own condition, two negative values of the personal adjustments, P-2 and P-1, exist. The dive computer then adjusts its mathematical model according to the entered Personal Adjustment setting, giving shorter (P1 or P2 selected), or longer (P-1 or P-2 selected) no-decompression times.

Table 5.7. Personal Adjustment settings

Personal adjustment value	**Condition**	**Desired tables**
P-2	Ideal conditions, excellent physical fitness, highly experienced with a lot of dives in the near past	Progressively less conservative
P-1	Ideal conditions, good physical fitness, well experienced with dives in the near past	
P0	Ideal conditions	Default
P1	Some risk factors or conditions exist	Progressively more conservative
P2	Several risk factors or conditions exist	

⚠ WARNING *Personal adjustment setting P0–P-2 causes a high risk of DCS, or other personal injury, and death.*

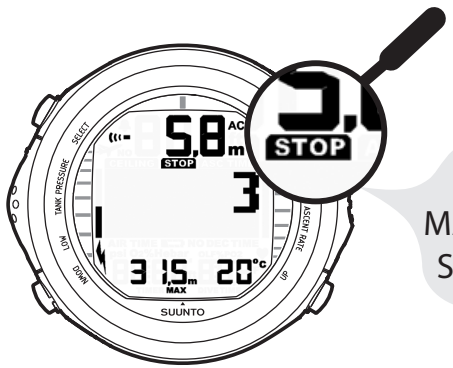
5.11. Safety Stops

Safety Stops are widely considered good diving practice for recreational diving, and are an integral part of most dive tables.The reasons for performing a Safety Stop include: reducing sub-clinical DCS, microbubble reduction, ascent control, and orientation before surfacing.

The Suunto DX displays two different types of Safety Stops: Recommended Safety Stop and Mandatory Safety Stop.

5.11.1. Recommended Safety Stops

With every dive over 10 meters, there is a three-minute countdown for the Recommended Safety Stop, to be taken in the 3–6 m/10–20 ft range. This is shown with the STOP sign and a three-minute countdown in the center window instead of the no-decompression time.



WHEN STOP IS DISPLAYED, MAKE A RECOMMENDED SAFETY STOP FOR 3 MINUTES.

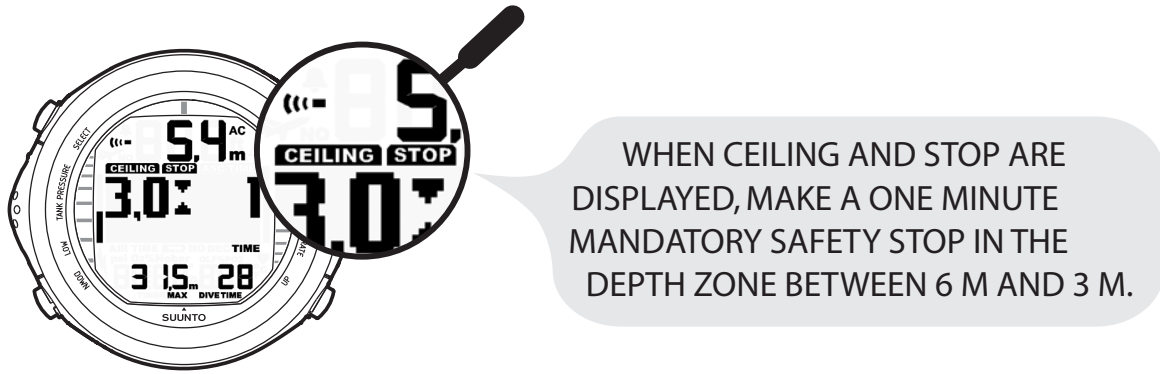
NOTE

The Recommended Safety Stop, as the name implies, is recommended. If it is ignored, there is no penalty applied to the following surface intervals and dives.

5.11.2. Mandatory Safety Stops

When the ascent rate exceeds 10 m/33 ft per minute continuously for more than five (5) seconds, the microbubble build-up is predicted to be more than is allowed for in the decompression model. The Suunto Fused RGBM calculation model responds to this by adding a Mandatory Safety Stop to the dive. The time of this Mandatory Safety Stop depends on the severity of the ascent rate excess.

The STOP sign is shown in the display and when you reach the depth zone between 6 m and 3 m/20 ft and 10 ft, the CEILING label, ceiling depth, and the calculated Safety Stop time also appear in the display. Wait until the Mandatory Safety Stop warning disappears. The total length of the Mandatory Safety Stop time depends on the seriousness of the ascent rate violation.



WHEN CEILING AND STOP ARE DISPLAYED, MAKE A ONE MINUTE MANDATORY SAFETY STOP IN THE DEPTH ZONE BETWEEN 6 M AND 3 M.

You must not ascend shallower than 3 m/10 ft with the Mandatory Safety Stop warning on. If you ascend above the Mandatory Safety Stop ceiling, a downward pointing arrow will appear and a continuous beeping starts. You should immediately descend to, or below, the Mandatory Safety Stop ceiling depth. If you correct this situation at any time during the dive, there are no effects on the decompression calculations for future dives.

WHEN CEILING AND STOP ARE DISPLAYED WITH DOWNWARD POINTING ARROW, IMMEDIATELY (WITHIN 3 MINUTES) DESCEND TO OR BELOW CEILING.

If you continue to violate the Mandatory Safety Stop, the tissue calculation model is affected and the dive computer may shorten the available no-decompression time for your next dive. In this situation, it is recommended that you prolong your surface interval time before your next dive.

5.12. Deep stops

In Suunto DX deep stops are activated on all dives below 20 m / 66 ft.

The Suunto Fused RGBM model calculates deep stops iteratively, placing the first stop about halfway between the maximum depth and the ceiling depth. After the first deep stop is completed, another deep stop will be prompted halfway to the ceiling, and so on until the ceiling depth is reached. However, deep stops are deactivated when the decompression ceiling descends to ¼th depth (or deeper) of maximum depth of the dive.

Enabling the deep stops does not disable Recommended Safety Stops. Mandatory Safety Stops, for example due to continuous ascent rate violations, are still prompted.

If a deep stop is violated, it does not cause the dive computer to go into an error (Er) mode. However, a penalty time may be added to the subsequent decompression.

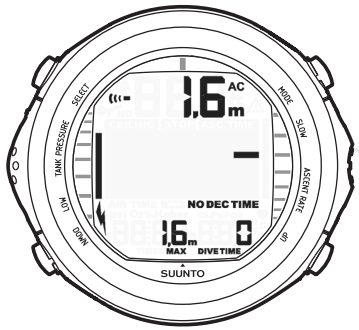
NOTE *With Deep Stops ON, the Recommended Safety Stops will still be activated at the end of the dive.*

6. DIVING

This section contains instructions on how to operate the dive computer and interpret its displays. The dive computer is easy to use and read. Each display shows only the data relevant to that specific diving mode.

6.1. Diving in the AIR mode (DIVE Air)

This section contains information on diving with standard air. To activate the DIVE Air mode, please refer to *Section 5.7. Accessing DIVE mode*.



DIVE HAS JUST BEGUN AND AVAILABLE NO-DECOMPRESSION TIME IS OVER 99 MINUTES SO NO VALUE IS DISPLAYED.

NOTE

The dive computer will remain in the SURFACE mode at depths less than 1.2 m/4 ft. At depths greater than 1.2 m/4 ft the instrument will go into the DIVE mode automatically. However, it is recommended that you activate the SURFACE mode manually before entering the water in order to perform the necessary dive pre-checks.

NOTE

The default fields shown on your dive computer in the DIVE mode are the ones you select while in the SURFACE mode.

6.1.1. Basic dive data

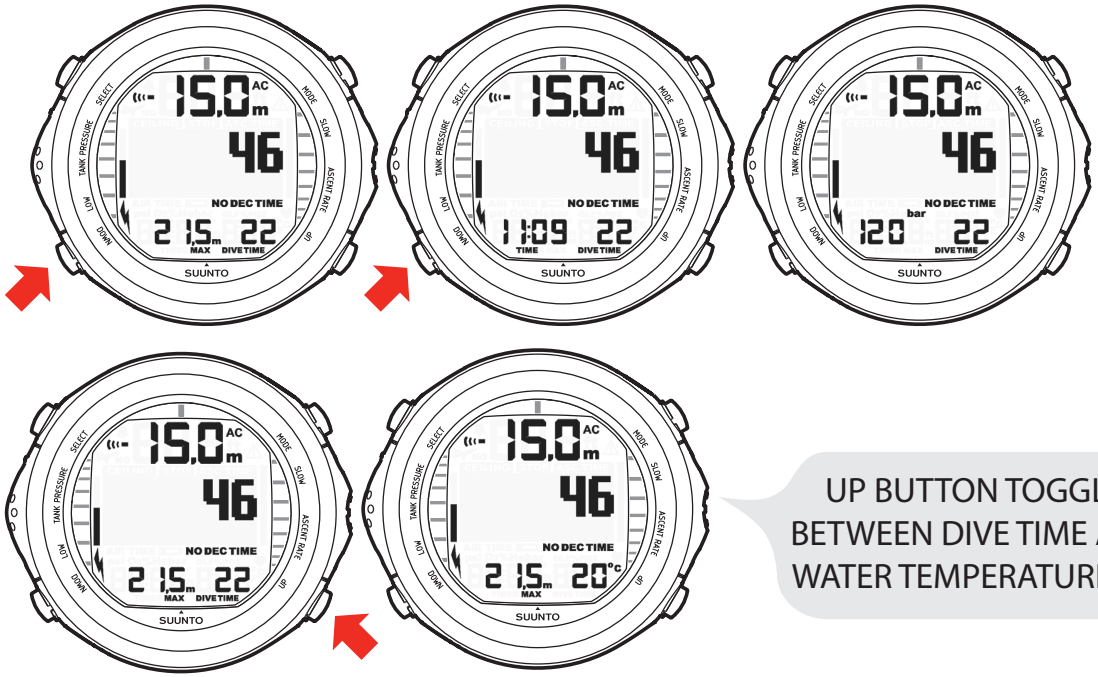
During a No-decompression dive, the following information is displayed:

- your present depth in meters/feet
- the available no-decompression time in minutes as NO DEC TIME
- the ascent rate presented as a bar graph on the right side
- the Diver Attention Symbol if surface interval should be prolonged (see *Table 7.1, Alarms*)

DIVE DISPLAY - PRESENT DEPTH IS 15 M,
NO-DECOMPRESSION STOP TIME LIMIT 46 MIN.
MAXIMUM DEPTH DURING THIS DIVE WAS 21.5 M,
ELAPSED DIVE TIME 22 MIN.

Alternative displays, by pressing the UP/DOWN buttons, show:

- the elapsed dive time in minutes, shown as DIVE TIME
- the water temperature in °C/°F
- the maximum depth during this dive in meters/feet, indicated as MAX
- the current time, shown as TIME


DOWN BUTTON TOGGLES BETWEEN MAXIMUM DEPTH, CURRENT TIME AND TANK PRESSURE.
UP BUTTON TOGGLES BETWEEN DIVE TIME AND WATER TEMPERATURE.

In addition, with the optional wireless transmission enabled:

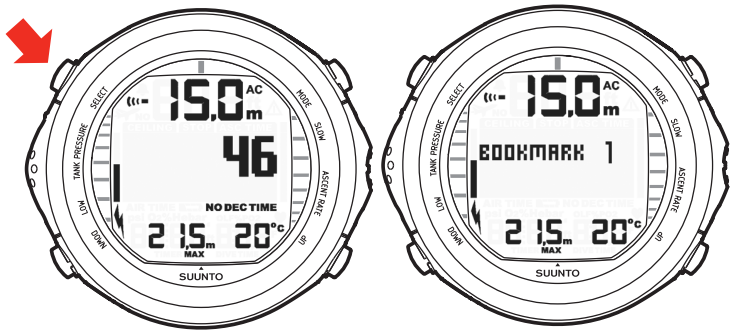
- the Remaining Air time in the left center window indicated as AIR TIME (Air Time must be set ON)
- the cylinder pressure in bar (or psi) displayed in the lower left corner
- the cylinder pressure graphically displayed on the left side

6.1.2. Bookmark

It is possible to record bookmarks in the profile memory during a dive. These bookmarks are displayed when scrolling the profile memory on the display. The bookmarks are also shown as annotations in the downloadable Suunto DM4 software.

The bookmark logs the depth, time, and water temperature, as well as compass heading (if the compass has been enabled) and tank pressure when available.

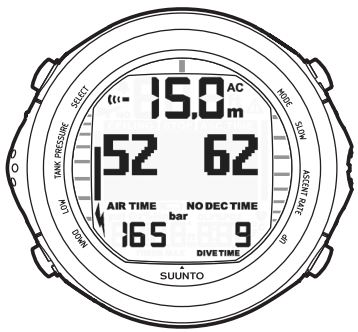
To make a bookmark in the profile memory during a dive, press the SELECT button. A brief confirmation will be given.



A BOOKMARK IS PLACED IN THE PROFILE MEMORY DURING A DIVE BY PRESSING THE SELECT BUTTON.

6.1.3. Tank pressure data

When using the optional wireless pressure transmitter, the pressure of your scuba cylinder in bars (or psi) is shown digitally in the lower left corner of the alternative display. Whenever you start a dive, the remaining air time calculation begins. After 30–60 seconds (sometimes more, depending on your air consumption), the first estimation of remaining air time is shown in the left center window of the display. The calculation is always based on the actual pressure drop in your cylinder and automatically adapts to your cylinder size and current air consumption.



CURRENT TANK PRESSURE IS 165 BAR AND THE REMAINING AIR TIME IS 52 MINUTES.

The change in your air consumption is based on constant one second interval pressure measurements over 30–60 second periods. An increase in air consumption influences the remaining air time rapidly, while a drop in air consumption increases the air time slowly. In this way, an over optimistic air time estimation, caused by a temporary drop in air consumption, is avoided.

The remaining air time calculation includes a 35 bar/500 psi safety reserve. This means that when the instrument shows the air time to be zero, there is still about 35 bar/500 psi of pressure left in your cylinder, depending on your air consumption rate. With a high consumption rate, the limit will be closer to 50 bar/700 psi and with a low rate closer to 35 bar/500 psi.

NOTE *Filling your BCD affects the air time calculation due to the temporary increase in air consumption.*

NOTE *The remaining air time is not displayed when either deep stops or the decompression ceiling have been activated. You can recall the remaining air time by long-pressing the DOWN button, but the ceiling disappears.*

NOTE *A change of temperature will affect the cylinder pressure and consequently the air time calculation.*

NOTE *If the air time is turned OFF, the air time is not displayed.*

Low Air Pressure Warnings

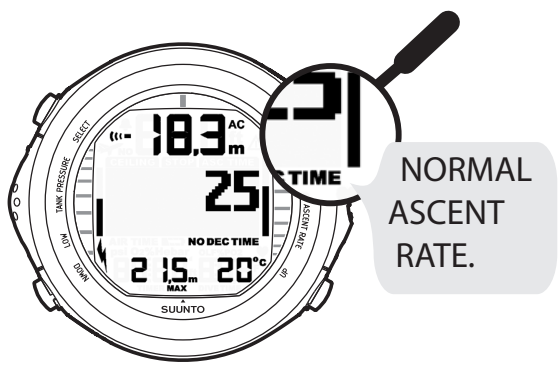
The dive computer will warn you with two (2) audible double beeps and a blinking pressure display when the cylinder pressure reaches 50 bar/700 psi.

Two (2) double beeps are also heard when the cylinder pressure goes down to the user-selected alarm pressure, and when the remaining air time reaches zero.

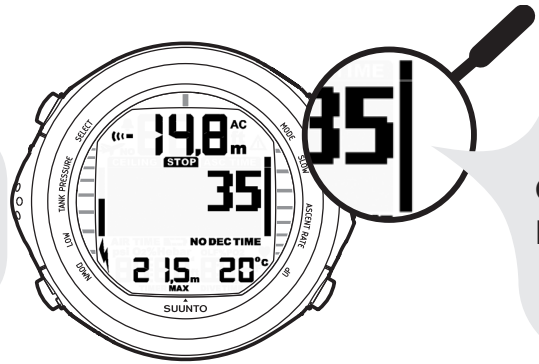
6.1.4. Ascent rate indicator

The ascent rate is displayed graphically along the right hand side with a vertical bar. When the maximum allowed ascent rate is exceeded, the lower segment of the bar starts to blink with the top segment staying solid, indicating that the maximum ascent rate has been exceeded.

Continuous ascent rate violations will result in Mandatory Safety Stops. When Recommended Deep Stop is enabled, the length is indicated in seconds.



NORMAL ASCENT RATE.



ACTIVATED BACKLIGHT, ALARM AND A BLINKING ASCENT RATE BAR GRAPH INDICATE YOU ARE ASCENDING FASTER THAN 10 M/MIN. YOU ARE ADVISED TO MAKE A MANDATORY SAFETY STOP WHEN YOU REACH A DEPTH OF 6 M.

⚠ WARNING

DO NOT EXCEED THE MAXIMUM ASCENT RATE! Rapid ascents increase the risk of injury. You should always make the Mandatory and Recommended Safety Stops after you have exceeded the maximum recommended ascent rate. If this Mandatory Safety Stop is not completed, the decompression model will penalize your next dive(s).

6.1.5. Safety Stops and Deep Stops

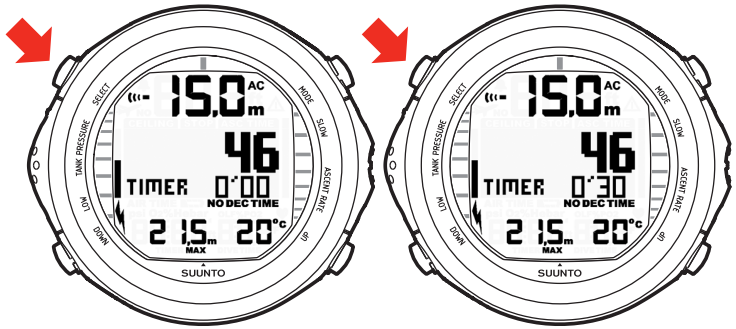
A three (3) minute Recommended Safety Stop is always prompted after every dive to over 10 m, regardless if deep stops are enabled or disabled.

DURING DESCENT, YOU'RE SHOWN THAT A DEEPSTOP IS NEEDED AT THE DEPTH OF 16 M.

DURING ASCENT, YOU'RE ADVISED TO MAKE A DEEP STOP AT 16 M FOR THE DURATION SHOW BY THE TIMER (42 S REMAINING).

6.1.6. Stopwatch (Timer)

You can also use a stopwatch during diving for various timing purposes. To activate the stopwatch in the DIVE AIR, MIXED or CCR mode, long-press the MODE button, then start and stop it by short-pressing the SELECT button.



START AND STOP THE TIMER BY PRESSING SELECT BUTTON.

6.1.7. Decompression dives

When your NO DEC TIME becomes zero, your dive changes into a decompression dive. Therefore, you must perform one or more decompression stops on your way to the surface. The NO DEC TIME on your display will be replaced by an ASC TIME, and a CEILING notation will appear. An upward pointing arrow will also prompt you to start your ascent.

If you exceed the no-decompression limits on a dive, the dive computer will provide the decompression information required for ascent. After this, the instrument will continue to provide subsequent interval and repetitive dive information.

Rather than requiring you to make stops at fixed depths, the dive computer lets you decompress within a range of depths (continuous decompression).

The ascent time (ASC TIME) is the minimum amount of time needed to reach the surface in a decompression dive. It includes:

- the time needed at the deep stop
- the time needed to ascend to the ceiling at an ascent rate of 10 m/33 ft per minute. The ceiling is the shallowest depth to which you should ascend.
- the time needed at the ceiling

- the time needed at the Mandatory Safety Stop (if any)
- the time needed to reach the surface after the ceiling and Safety Stops have been completed

⚠ WARNING

YOUR ACTUAL ASCENT TIME MAY BE LONGER THAN DISPLAYED BY THE INSTRUMENT! The ascent time will increase if you:

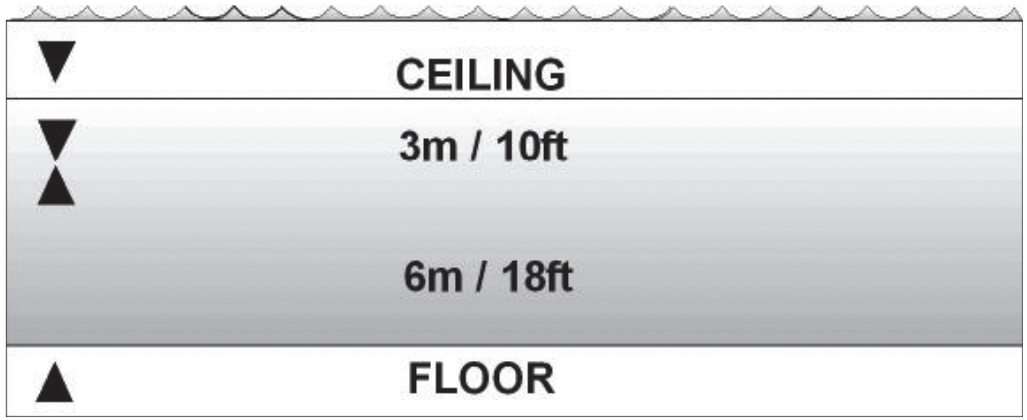
- *remain at depth*
- *ascend slower than 10 m/33 ft per minute or*
- *make your decompression stop deeper than at the ceiling*

These factors will also increase the amount of breathing gas required to reach the surface.

Ceiling, ceiling zone, floor and decompression range

When in decompression, it is important that you understand the meaning of ceiling, floor, and decompression range.

- The ceiling is the shallowest depth to which you should ascend when in decompression. At this depth, or below, you must perform all stops.
- The ceiling zone is the optimum decompression stop zone. It is the zone between the minimum ceiling and 1.2 m/4 ft below the minimum ceiling.
- The floor is the deepest depth at which the decompression stop time will not increase. Decompression will start when you pass this depth during your ascent.
- The decompression range is the depth range between the ceiling and floor. Within this range, decompression takes place. However, it is important to remember that the decompression will be very slow at, or close to, the floor.



The depth of the ceiling and floor depends on your dive profile. The ceiling depth will be fairly shallow when you enter the decompression mode, but if you remain at depth, it will move downward and the ascent time will increase. Likewise, the floor and ceiling may change upwards while you are decompressing.

When conditions are rough, it may be difficult to maintain a constant depth near the surface. In such cases, it is more manageable to maintain an additional distance below the ceiling, to ensure that the waves do not lift you above the ceiling. Suunto recommends that decompression takes place deeper than 4 m/13 ft, even if the indicated ceiling is shallower.

NOTE *It will take more time and more breathing gas to decompress below the ceiling than at the ceiling.*

WARNING *NEVER ASCEND ABOVE THE CEILING! You must not ascend above the ceiling during your decompression. In order to avoid doing so by accident, you should stay somewhat below the ceiling.*

Display below the floor

The blinking ASC TIME sign and an upward pointing arrow indicate that you are below the floor. You should start your ascent immediately. The ceiling depth is shown on the left side, and the minimum total ascent time on the right side of the center window. Below is an example of a decompression dive without Deep Stops, below the floor.

UPWARD POINTING ARROW, BLINKING ASC TIME AND AN ALARM TELL YOU TO ASCEND. MINIMUM TOTAL ASCENT TIME INCLUDING SAFETY STOP IS 9 MINUTES. CEILING IS AT 3 M.

Display above the floor

When you ascend above the floor, the ASC TIME sign stops blinking and the upward pointing arrow disappears. Below is an example of a decompression dive above the floor.

UPWARD POINTING ARROW HAS DISAPPEARED AND ASC TIME LABEL HAS STOPPED BLINKING, MEANING YOU ARE IN THE DECOMPRESSION RANGE.

Decompression will now begin, but is very slow. Therefore, you should continue your ascent.

Display at the ceiling zone

When you reach the ceiling zone, the display will show you two arrows pointing at each other (the “hour glass” icon). Below is an example of a decompression dive at the ceiling zone.

TWO ARROWS POINT AT EACH OTHER “HOUR GLASS”. YOU ARE IN THE OPTIMUM CEILING ZONE AT 3 M AND YOUR MINIMUM ASCENT TIME IS 9 MINUTES.

During the decompression stop, ASC TIME will count down towards zero. When the ceiling moves upwards, you can ascend to the new ceiling. You may surface only after the ASC TIME and CEILING labels have disappeared, which means that the decompression stop and any Mandatory Safety Stop have been completed. You are advised, however, to stay until the STOP sign has also disappeared. This indicates that the three (3) minute Recommended Safety Stop has also been completed.

Display above the ceiling

If you ascend above the ceiling during a decompression stop, a downward pointing arrow will appear and a continuous beeping starts.

DECOMPRESSION DIVE, ABOVE CEILING. NOTE DOWNWARD POINTING ARROW, ER WARNING AND ALARM. YOU SHOULD IMMEDIATELY (WITHIN 3 MINUTES) DESCEND TO OR BELOW CEILING.

In addition, an Error warning (Er) reminds you that you have only three (3) minutes to correct the situation. You must immediately descend to, or below, the ceiling.

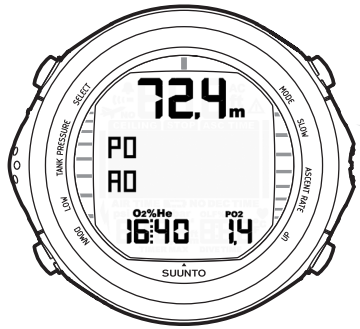
If you continue to violate the decompression, the dive computer will go into a permanent Error Mode. In this mode, the instrument can only be used as a depth gauge and timer. You must not dive again for at least 48 hours (refer to *Section 5.5. Error conditions*).

6.2. Diving in MIXED or CCR mode

The MIXED mode is used when diving with open-circuit air or with oxygen- or helium-enriched gas mixes and it allows setting up to eight different gas mixes. The CCR mode is used when diving with a rebreather and it allows setting up to three diluent gases and up to eight different gas mixes. Refer to *Section 5.9. Before diving in the MIXED or CCR mode*

6.2.1. Oxygen and helium displays

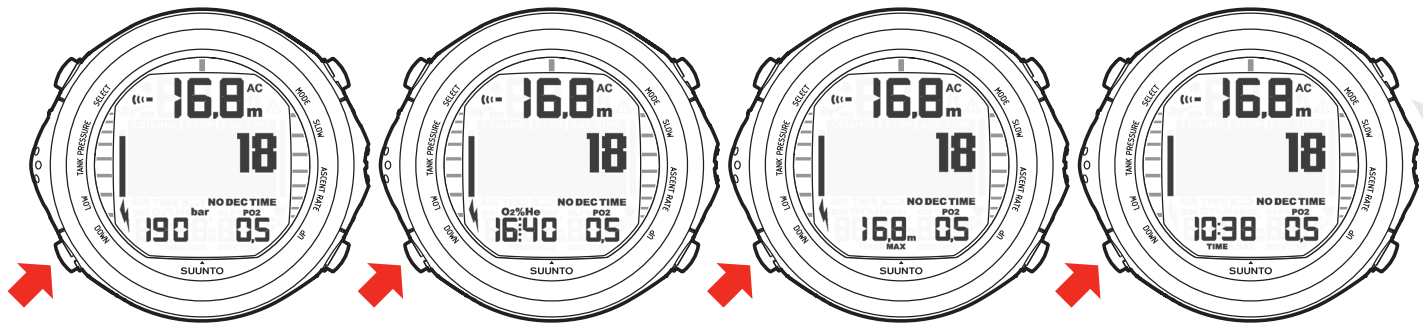
When the DIVE MIXED or CCR mode is activated, the display will show the information in the figure below. In the MIXED mode, the maximum operational depth is calculated based on set O_2%, He% and PO_2 values. In CCR mode, the PO_2 value denotes the currently selected set point.



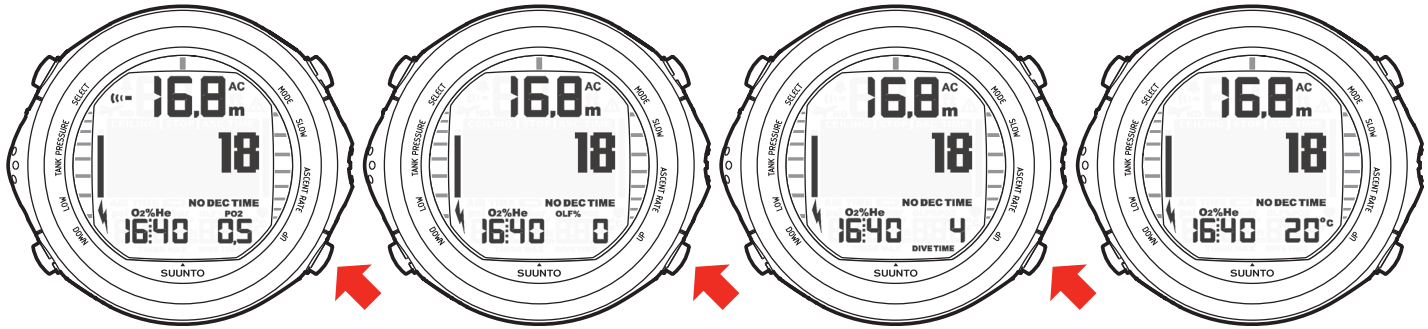
ACTIVATION DISPLAY BRIEFLY SHOWS THE MAXIMUM OPERATING DEPTH, PERSONAL/ALTITUDE SETTINGS, O_2%|HE VALUES AND PO_2 VALUE (IN CCR MODE THIS IS THE CURRENTLY SELECTED SET POINT)

If diving in the MIXED or CCR mode, the Suunto DX will additionally show on the alternative display (press UP and DOWN buttons to toggle values):

- the oxygen and helium percentage, labeled O_2%/He
- the set oxygen partial pressure limit, labeled PO_2 (MIXED mode)
- the selected set point, labeled PO_2 (CCR mode)
- the current oxygen toxicity exposure, labeled OLF%
- maximum depth
- current time
- water temperature
- dive time
- tank pressure (if enabled)



DOWN BUTTON TOGGLES BETWEEN O_2:HE, MAXIMUM DEPTH, CURRENT TIME, AND TANK PRESSURE.



UP BUTTON TOGGLES BETWEEN PO_2, OLF%, DIVE TIME AND WATER TEMPERATURE.

6.2.2. Oxygen limit fraction (OLF%)

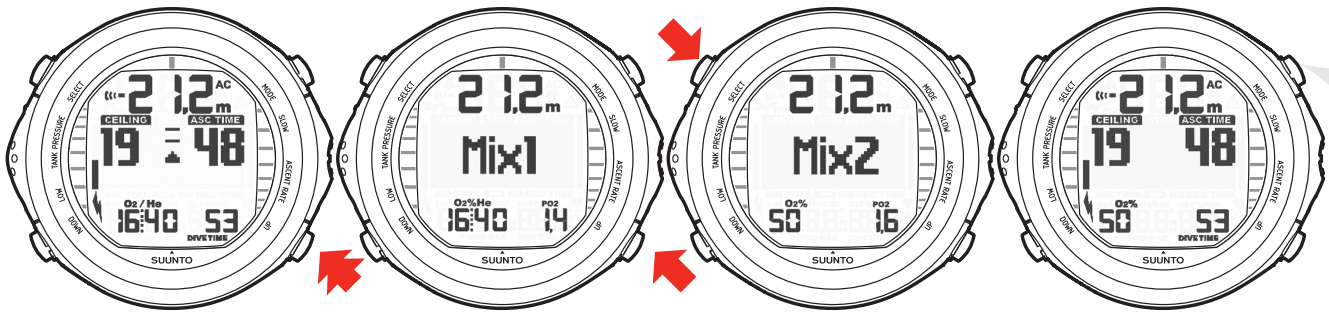
If set to the MIXED or CCR mode, in addition to tracking the diver's exposure to inert gas, the instrument tracks the exposure to oxygen. These calculations are treated as entirely separate functions.

The dive computer calculates separately for Central Nervous System oxygen toxicity (CNS) and Pulmonary Oxygen toxicity, the latter measured by the addition of Oxygen Toxicity Units (OTU). Both fractions are scaled so that the maximum tolerated exposure for each is expressed as 100%.

The Oxygen Limit Fraction (OLF%) displays only the value of the higher of the two calculations. The oxygen toxicity calculations are based on the factors listed in *Section 10.3. Oxygen exposure*.

6.2.3. Gas change and multiple breathing gas mixes in MIXED mode

The Suunto DX allows gas changes to enabled gas mixes during the dive. When the maximum operating depth allows for a gas change, the dive computer prompts you to change the gas. When PO_2 permits better decompression gas to be used, the dive computer prompts it automatically if it is set as primary. Gas changes are made by following the procedure below:



CHANGING GAS MIX. LONG PRESS UP, THEN SCROLL THROUGH ENABLED MIXES BY PRESSING THE UP OR DOWN BUTTONS. SELECT NEW MIX BY PRESSING THE SELECT BUTTON.

NOTE

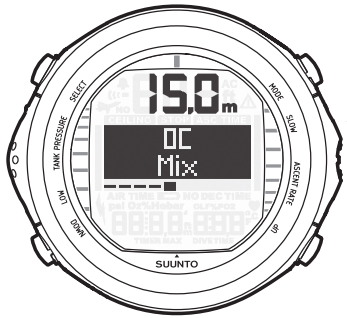
Mix number, O_2%, He% and PO_2 for the mixes are shown when scrolling. If the set PO_2 limit is exceeded, it will be shown with the PO_2 value blinking. The dive computer does not allow you to change to a gas whose set PO_2 is exceeded. In such a case, the mix is shown but cannot be selected. If the PO_2 is less than 0.18 bar, the dive computer gives an alarm.

NOTE

If no button is pressed in 15 seconds, the dive computer will go back to the dive display without changing the gas mix. Upon ascent, the computer prompts you to change gas when the PO_2 level you have set for the next mix allows a gas change. The prompt is a low priority alarm followed by the "Change gas" beep, sounded once. The Gas mix (O_2%:He) value blinks.

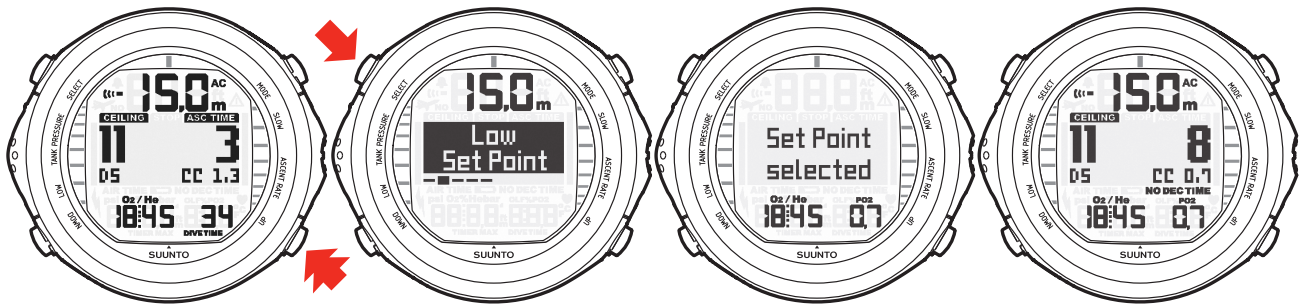
6.2.4. Set point and diluent/gas mix change in CCR mode

The Suunto DX allows both set point as well as diluent and gas mix changes to enabled gas mixes during the dive. Enter the selection menu during the dive by long pressing UP.



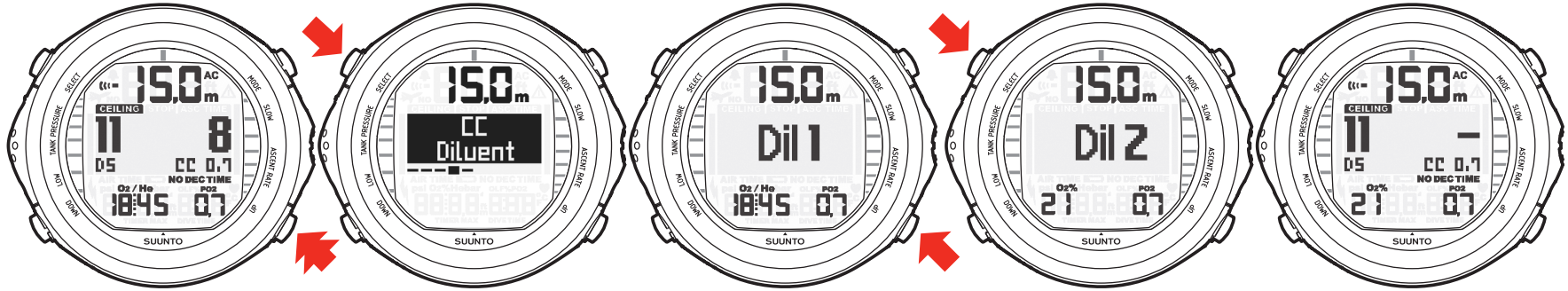
ENTER THE SELECTION MENU BY LONG PRESSING UP BUTTON, THEN SCROLL BY PRESSING UP BUTTON.

The high and low set points or a custom set point can be adjusted during the dive.



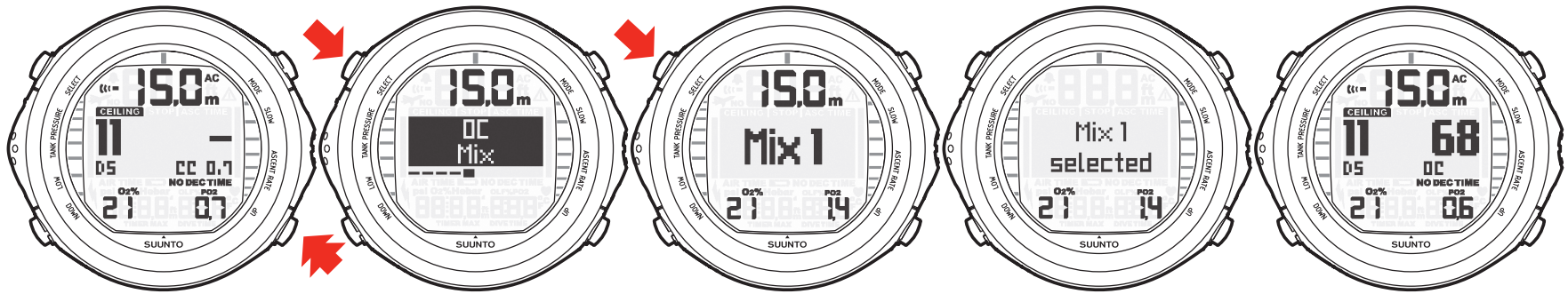
ADJUST WITH UP AND DOWN BUTTONS. ACCEPT WITH SELECT BUTTON.

Diluent change during dive:



CHANGING DILUENT. LONG PRESS UP, THEN ENTER THE CC DILUENT MENU. SCROLL THROUGH ENABLED DILUENTS BY PRESSING UP BUTTON. SELECT NEW DILUENT BY PRESSING THE SELECT BUTTON.

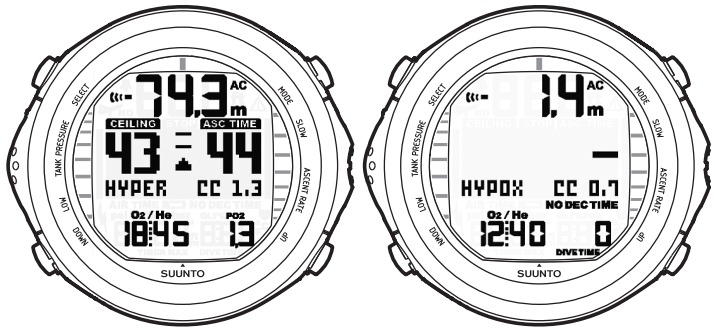
Enabled open-circuit gas changes are made in the same way and at the same time the CC dive changes to an open-circuit (OC) dive. This feature is useful in bail-out situation.



ENTER THE SELECTION MENU BY LONG PRESSING UP BUTTON, THEN SCROLL TO OC MIX BY PRESSING UP BUTTON. CONFIRM SELECTION WITH SELECT BUTTON. TEXT OC APPEARS ON THE DISPLAY.

6.2.5. Hyperoxic and hypoxic mixes in CCR

Suunto DX displays text HYPER if the Diluent gas PO_2 at the current depth is over 1.6. Text HYPOX is displayed if the Diluent gas PO_2 at the current depth is less than 0.18.



6.3. Diving in the GAUGE mode (DIVE Gauge)

If set to the GAUGE mode, the dive computer can be used as a bottom timer.

In the GAUGE mode, the total dive time is always displayed in minutes in the lower right corner. In addition, a Dive Timer in the center window displays time in minutes and seconds. The center window Dive Timer is activated at the start of the dive and it can be reset during the dive and used as a stopwatch by pressing the SELECT button.

BY PRESSING THE SELECT BUTTON DURING A DIVE, A BOOKMARK IS WRITTEN IN THE PROFILE MEMORY, THE DIVE TIMER IS RESET, AND THE PREVIOUSLY-TIMED INTERVAL IS DISPLAYED BELOW.

NOTE *The GAUGE mode does not provide decompression information.*

NOTE *There is no ascent rate monitoring in the mode.*

NOTE *If you dive with the GAUGE mode, it is not possible to change between the modes before the no fly time has counted down. In GAUGE mode, the no-fly time is always 48 hours.*

7. AFTER DIVING

Once back at the surface, Suunto DX continues to provide post-dive safety information and alarms. Calculations to enable repetitive dive planning also help to maximize diver safety.

Table 7.1. Alarms

Symbol on display	Indication
⚠	Diver Attention Symbol - Extend Surface Interval
Er	Violated Decompression Ceiling or Too Long Bottom Time
NO	Do Not Fly Symbol

7.1. Surface interval

An ascent to any depth shallower than 1.2 m/4 ft will cause the DIVE display to be replaced by the SURFACE display:

IT IS 6 MINUTES SINCE YOU SURFACED FROM A 35-MINUTE DIVE. THE MAXIMUM DEPTH WAS 21.5 M. THE PRESENT DEPTH IS 0.0 M. THE AIRPLANE SYMBOL AND NO-FLY VALUE INDICATE THAT YOU SHOULD NOT FLY FOR 14 HOURS, 28 MINUTES. THE DIVER ATTENTION SYMBOL INDICATES THAT YOU SHOULD PROLONG YOUR SURFACE INTERVAL TIME.

Or, in the alternative displays, the following information will be shown:

- maximum depth of last dive in meters/feet
- dive time of last dive in minutes, shown as DIVE TIME
- the current time, shown as TIME
- the current temperature in °C/°F
- cylinder pressure in bar/psi (if enabled)

If set to MIXED or CCR mode, the following information will also be shown:

- the oxygen and helium percentages, labeled O_2%/He
- the oxygen partial pressure labeled PO_2
- the current oxygen toxicity exposure labeled OLF%

7.2. Dive numbering

Several repetitive dives are considered to belong to the same repetitive dive series when the dive computer has not counted the no-fly time to zero. Within each series, the dives are given individual numbers. The first dive of the series will be numbered as DIVE 1, the second as DIVE 2, the third as DIVE 3, and so on.

If you start a new dive with less than five (5) minutes of surface interval time, the dive computer interprets this as a continuation of the previous dive and the dives are considered to be the same. The diving display will return, the dive number will remain unchanged, and the dive time will begin where it left off. After five (5) minutes on the surface, subsequent dives are, by definition, repetitive. The dive counter displayed in the Planning mode will increment to the next number if another dive is made.

7.3. Repetitive dive planning

The Suunto DX includes a dive planner that allows you to review the no-decompression limits on a subsequent dive, taking the residual inert gas loading of previous dives into consideration. The DIVE PLANNING mode is explained in *Section 7.5. DIVE PLANNING mode (PLAN NoDec)*.

7.4. Flying after diving

In the DIVE mode, the no-fly time is displayed in the center window next to the airplane image. In the TIME mode, the airplane image is shown in the top left corner. Flying or traveling to a higher altitude should be avoided at any time when the computer is counting down the no-fly time.

The no-fly time is always at least 12 hours, or equivalent to the so-called desaturation time (if longer than 12 hours). For desaturation times lower than 70 minutes, no no-fly time is given.

In the Permanent Error mode the no-fly time is 48 hours.

The Divers Alert Network (DAN) recommends the following on no-fly times:

- A minimum surface interval of 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jetliner (altitude up to 2,400 m/8,000 ft).

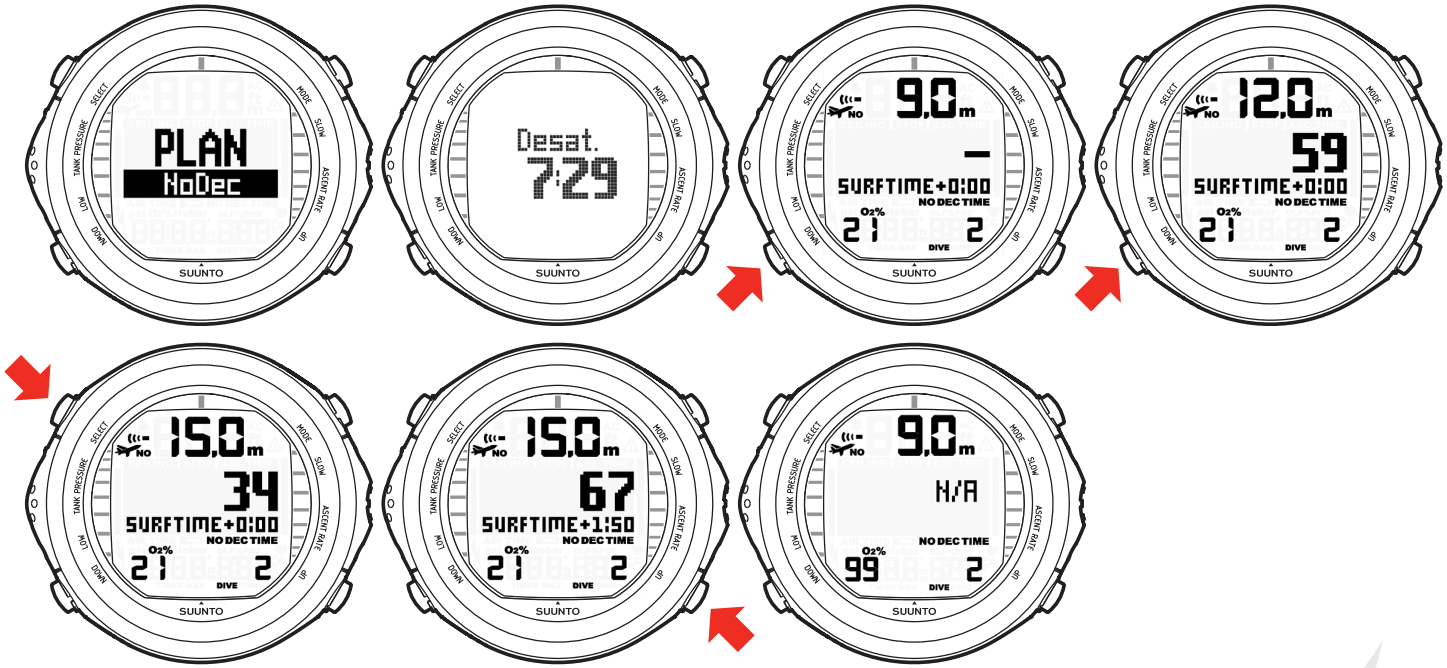
- Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended interval beyond 12 hours before a flight. Further, the Undersea and Hyperbaric Medical Society (UHMS) suggests divers using standard air cylinders and exhibiting no symptoms of decompression sickness wait 24 hours after their last dive to fly in an aircraft with cabin pressure up to 2,400 m/8,000 ft. The only two exceptions to this recommendation are:
  - If a diver has less than two (2) hours total accumulated dive time in the last 48 hours, a 12 hour surface interval before flying is recommended.
  - Following any dive that required a decompression stop, flying should be delayed for at least 24 hours, and if possible, for 48 hours.
- Suunto recommends that flying is avoided until all the DAN and UHMS guidelines, as well as the dive computer's no-fly conditions, are satisfied.

7.5. DIVE PLANNING mode (PLAN NoDec)

The DIVE PLANNING mode displays no-decompression times for a new dive, taking into account the effects of previous dives.

When entering the DIVE PLANNING mode (PLAN NoDec) mode, the display first briefly shows the remaining desaturation time before going into plan mode.

By pressing the UP/DOWN buttons, you can scroll the no-decompression limits in 3 m/10 ft increments ending at 45 m/150 ft. No-decompression limits longer than 99 minutes are displayed as "—". During a dive series (between two consecutive dives) it is also possible to enter the surface interval time as a planning parameter. If the O_2% is too high for the planned depth, NA is displayed instead of a numerical no-decompression limit.



WHEN ENTERING THE PLAN MODE THE DISPLAY FIRST BRIEFLY SHOWS THE REMAINING DESATURATION TIME BEFORE GOING INTO PLAN MODE. USE UP AND DOWN BUTTONS TO SCROLL NO-DECOMPRESSION LIMITS AT DIFFERENT DEPTHS. YOU CAN ALSO ADJUST YOUR SURFACE INTERVAL TIME TO YOUR PLAN. NO-DECOMPRESSION LIMITS LONGER THAN 99 MINUTES ARE DISPLAYED AS "–".

The Planning mode takes into account the following information from previous dives:

- any calculated residual nitrogen
- all dive history for the past four days

The no-decompression times given for different depths will therefore be shorter than before your first "fresh" dive.

You can exit the DIVE PLANNING mode by pressing the MODE button.

NOTE

The DIVE PLANNING mode is disabled in GAUGE mode and in Error mode (see Section 5.5. Error conditions).
The DIVE PLANNING mode calculates no-decompression times for Diluent 1 / Mix1 only. If additional mixes are enabled in the MIXED or CCR mode, they do not affect the calculations in (PLAN NoDec) mode.

Higher Altitude and conservative Personal Adjustment settings will shorten the no-decompression time limits. These limits at different Altitude and Personal Adjustment setting selections are explained in *Section 5.10.3. Diving at altitude* and in *Section 5.10.4. Personal adjustments*.

7.5.1. Dive numbering shown during dive planning

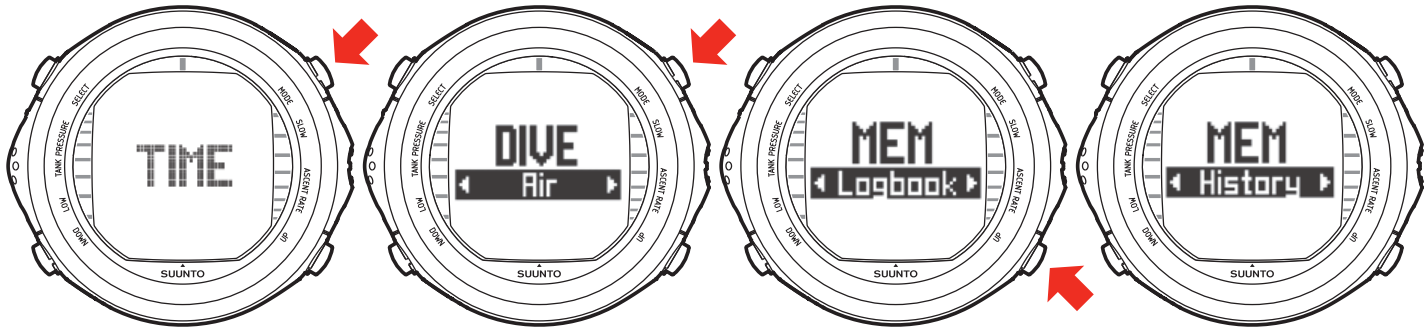
Dives belong to the same repetitive dive series if the instrument was still counting down the no-fly time at the beginning of the dive.

The surface interval must be at least five (5) minutes for a dive to be considered a repetitive dive. Otherwise, it is considered a continuation of the same dive. The dive number will not change and the dive time will continue where it left off. (Refer also to *Section 7.2. Dive numbering*).

7.6. MEMORY mode

The memory options in the MEMORY mode include dive logbook (MEM Logbook) and dive history (MEM History). They are accessed from the DIVE mode and you can toggle between them by using the UP/DOWN buttons.

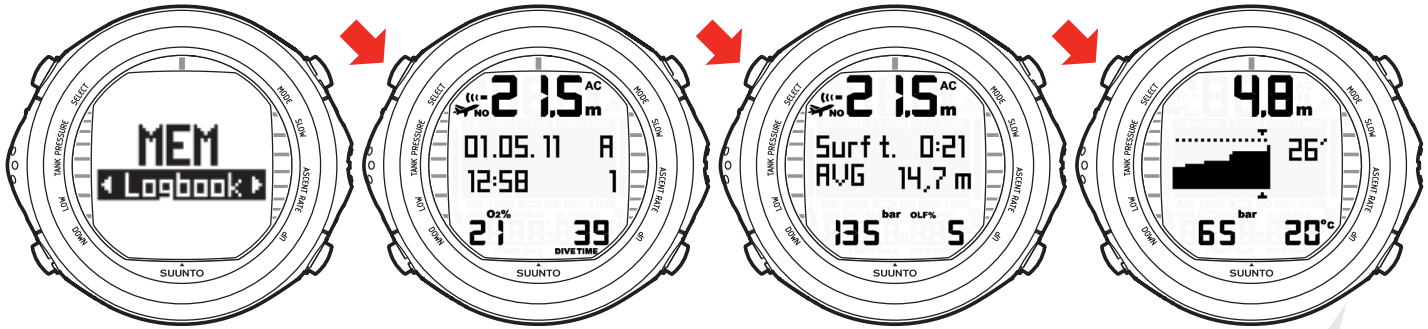
The dive entry time and date is registered in the Logbook memory. Always check before diving that the time and date are correctly set, especially after travelling between different time zones.



7.6.1. Dive logbook (MEM Logbook)

The Suunto DX has a very sophisticated, high capacity Logbook and Profile Memory. The data is recorded in the profile memory based on the selected sample rate.

The END OF LOGS text is displayed between the oldest and most recent dive. The following information will be shown on three pages:



THERE ARE THREE PAGES OF LOGBOOK DIVE INFORMATION. USE SELECT BUTTON TO SCROLL BETWEEN LOGBOOK PAGES I, II, AND III. THE DATA OF THE MOST RECENT DIVE IS SHOWN FIRST. YOU CAN SCROLL THE GRAPHICAL DIVE PROFILE ON PAGE III WITH UP BUTTON. LONG-PRESS UP BUTTON TO AUTO-SCROLL THE DIVE PROFILE GRAPH FORWARD.

Page I, main display

- maximum depth
- date of dive
- type of dive (AIR, MIXED, CCR, GAUGE)
- dive start time
- dive number
- oxygen percentage for the first used gas mix
- helium percentage for the first used gas mix
- total dive time (in minutes in all modes)

Page II

- maximum depth
- surface time after previous dive
- average depth

- consumed pressure (if enabled)
- warnings
- OLF% (AIR, MIXED, CCR)

Page III

- depth/time profile of the dive
- water temperature
- tank pressure (if enabled)
- gas changes (MIXED, CCR)
- set point changes (CCR)

NOTE *Memory capacity depends on the selected sample rate. With factory default setting (20 s) and without transmitter data the capacity is approximately 140 hours. With transmitter data the capacity is minimum 35 hours. After that, when new dives are added, the oldest dives are deleted. The contents of the memory will remain when the battery is changed (providing that the battery has been replaced according to the instructions).*

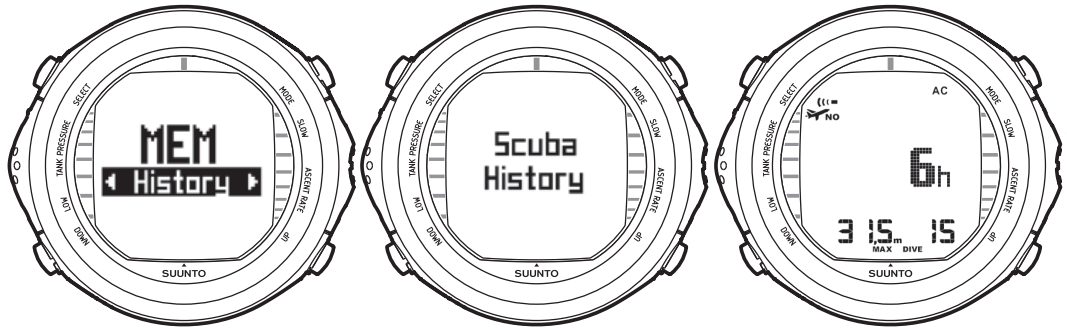
NOTE *Several repetitive dives are considered to belong to the same repetitive dive series if the no-fly time has not ended. See Section 7.2. Dive numbering for further information.*

NOTE *Depending on the sampling rate, the maximum depth reading may differ from the maximum depth reading of the Dive History up to 0.3 m/1 ft.*

7.6.2. Dive history

The dive history is a summary of all the dives recorded by the dive computer.

The following information will be shown on the display:



DIVE HISTORY DISPLAY. TOTAL NUMBER OF DIVES, DIVE HOURS AND MAXIMUM DEPTH.

The Dive History Memory can hold a maximum of 999 dives and 999 diving hours. When these maximum values are reached, the counters will start again from zero.

NOTE *The maximum depth can be reset to 0.0 m/0 ft using the PC Interface cable and the downloadable Suunto DM4 software.*

7.7. Suunto DM4

The Suunto DM4 is an optional software that greatly enhances the functionality of your Suunto DX. With the DM4 software, you can download dive data from your dive computer to your laptop. After that, you can view and organize all the data recorded with your Suunto DX. You can plan dives (with Suunto Dive Planner), print copies of your dive profiles, and also upload your dive logs to share with your friends at *http://www.movescount.com* (see *Section 7.8. Movescount*). You can always download the latest version of the DM4 from *http://www.suunto.com*. Please check for updates regularly as new features are constantly being developed. The following data is transferred from your dive computer to your laptop (optional, cable required):

- depth profile of the dive
- dive time
- preceding surface interval time
- dive number
- dive start time (year, month, day, and time)
- dive computer settings
- oxygen percentage settings and maximum OLF (in the MIXED and CCR mode)
- tissue calculation data
- real-time water temperature
- tank pressure data (if enabled)
- additional dive information (for example, SLOW and Mandatory Safety Stop violations, Diver Attention Symbol, Bookmark, Surfaced Mark, Decompression Stop Mark, and Ceiling Error Mark)
- dive computer serial number
- personal information (30 characters)

By using the DM4, you are able to enter setup options such as:

- input a personal, 30-character field into the Suunto instrument.
- manually add comments, multimedia and other personal information to the PC-based dive data files

7.8. Movescount

Movescount is an online sports community that offers you a rich set of tools to manage all you sports and create engaging stories about your diving experiences. Movescount offers you new ways to get inspired and share your best dives with other community members!

To connect to Movescount:

1. Go to *www.movescount.com*.
2. Register and create your free Movescount account.
3. Download and install the Suunto DM4 software from the Movescount.com website if you do not already have the DM4 installed on your laptop

To transfer data:

1. Connect your dive computer to your laptop.
2. Download your dives to the DM4 on your laptop.
3. Follow the instructions on the DM4 on how to transfer your dives to your Movescount.com account.

8. CARE AND MAINTENANCE OF MY SUUNTO DIVING COMPUTER

The SUUNTO dive computer is a sophisticated precision instrument. Although it is designed to withstand the rigors of scuba diving, you must treat it with the same proper care and caution as any other precision instrument.

- WATER CONTACTS AND PUSH BUTTONS

  Contamination or dirt on the water contacts/connector or push buttons may prevent the automatic activation of the Dive Mode and cause problems during the data transfer. Therefore, it is important that the water contacts and push buttons are kept clean. If the water contacts are active (AC text remains on display) or the Dive Mode activates on its own, the reason for this is probably contamination or invisible marine growth, which may create an electric current between the contacts. It is important that the dive computer is carefully washed in fresh water after the day's diving is completed. The contacts can be cleaned with fresh water and, if necessary, a mild detergent and a soft brush.
- CARE OF YOUR DIVE COMPUTER
  - NEVER try to open the case of the dive computer.
  - Have your dive computer serviced every two years or after 200 dives (whichever comes first) by an authorized SUUNTO service center. This service will include a general operational check, replacement of the battery, and water resistance check. The service requires special tools and training. Do not attempt to do any servicing that you are not sure of.
  - Should moisture appear inside the case or battery compartment, immediately have the instrument checked by your SUUNTO service center.

- The specific scratch guard for DX is designed to help the display from getting scratched. They can be purchased separately from your nearest retailer. The scratch guard is easy to attach and also to replace if needed (for more information, see the instructions on *www.suunto.com*).
- Should you detect scratches, cracks or other such flaws on the display that may impair its durability, immediately have it replaced by your SUUNTO dealer or distributor.
- Wash and rinse the unit in fresh water after every use.
- Protect the unit from shock, extreme heat, direct sunlight, and chemical attack. The dive computer cannot withstand the impact of heavy objects like scuba cylinders, nor chemicals like gasoline, cleaning solvents, aerosol sprays, adhesive agents, paint, acetone, alcohol, and so on. Chemical reactions with such agents will damage the seals, case and finish.
- Store your dive computer in a dry place when you are not using it.
- The dive computer will display a battery symbol as a warning when the power gets too low. When this happens, the instrument should not be used until the battery has been replaced.
- Do not fasten the strap of your dive computer too tightly. You should be able to insert your finger between the strap and your wrist.

- MAINTENANCE

  The instrument should be soaked, thoroughly rinsed with fresh water, then dried with a soft towel after each dive. Make sure that all salt crystals and sand particles have been flushed out. Check the display for possible moisture or water. DO NOT use the dive computer if you detect any moisture or water inside. Contact an authorized Suunto service center for battery replacement or other service.

  CAUTION!

  - Do not use compressed air to blow water off the unit.
  - Do not use solvents or other cleaning fluids that might cause damage.
  - Do not test or use the dive computer in pressurized air.
- WATER RESISTANCE INSPECTION

  The water resistance of the unit must be checked after replacing the battery or after other service operations. The check requires special equipment and training. You must frequently check the display for any sign of leaks. If you find moisture inside your dive computer, there is a leak. A leak must be corrected without delay as moisture may seriously damage the unit, even beyond repair. SUUNTO does not take any responsibility for damage caused by moisture in the dive computer unless the instructions of this manual are carefully followed. In the event of a leak, immediately take the dive computer to an authorized SUUNTO service center.

FAQs

For more information on service, please refer to FAQs on *www.suunto.com*.

9. BATTERY REPLACEMENT

9.1. Computer battery replacement

NOTE *It is advisable to contact an authorized Suunto service center for battery replacement. It is imperative that the change is made in a proper manner to avoid any leakage of water into the battery compartment or computer.*

⚠ CAUTION *Defects caused by improper battery installation are not covered by the warranty.*

⚠ CAUTION *When the battery is changed, all nitrogen and oxygen uptake data is lost. Therefore, the no-fly time shown by the computer should have reached zero or you must wait for 48 hours, or preferably even 100 hours, before you dive again.*

All history and profile data, as well as the altitude, personal and alarm settings, will remain in the dive computer memory after the battery change. However, the clock time and time alarm settings are lost. In the MIXED and CCR mode, the gas settings also revert back to default settings (Diluent 1/Mix1 21 % O_2, 1.4 bar PO_2, Diluent 2 - Diluent 3/Mix2-Mix8 OFF).

9.2. Wireless transmitter battery replacement

NOTE *It is advisable to contact an authorized Suunto service center for transmitter battery replacement. It is imperative that the change is made in a proper manner to avoid any leakage of water into the transmitter.*

9.2.1. Transmitter battery kit

The transmitter battery kit includes a 3.0 V CR ½ AA lithium cell battery and a lubricated O-ring. When handling the battery, do not make contact with both of the poles at the same time. Do not touch the metal surfaces of the battery with your bare fingers.

9.2.2. Required tools

- A Phillips-head screwdriver
- Soft cloth for cleaning

9.2.3. Replacing the transmitter battery

To change the transmitter battery:

1. Remove the transmitter from the regulator HP port.
2. Unscrew and remove the four Phillips screws on the back of the transmitter.
3. Pull off the transmitter cover.
4. Carefully remove the O-ring. Be careful not to damage the sealing surfaces.
5. Carefully remove the battery. Do not touch the electrical contacts or the circuit board.

Check for any traces of leakage, or for any other damage. If there is a leak or any other damage, take the transmitter to an authorized Suunto representative or distributor for checking and repair.

6. Check the condition of the O-ring. A defective O-ring may indicate sealing or other problems. Dispose of the old O-ring, even if it seems to be in good condition
7. Check that the O-ring groove and the sealing surface of the cover are clean. Clean them with a soft cloth if necessary.
8. Gently insert the new battery into the battery compartment. Check the polarity of the battery. The "+" mark should point toward the top of the compartment and the "-" mark towards the bottom.

NOTE *It is imperative that you wait at least 30 seconds before re-installing the transmitter battery.*

When the battery is re-installed, the transmitter sends an overpressure (“---“) signal on code 12 for 10 seconds, after which it goes to normal operation, and shuts down after five (5) minutes.

9. Check that the new lubricated O-ring is in good condition. Put it in the right position in the O-ring groove. Be very careful not to get any dirt on the O-ring or its sealing surfaces.
10. Carefully put the transmitter cover into place. Note that the cover will only fit in one position. Match the three slots on the inside of the cover with the three ledges below the battery.
11. Screw the four screws back into place.

10. TECHNICAL DATA

10.1. Technical specifications

Dimensions and weight:

Dive Computer

- Diameter: 49 mm/1.94 in
- Thickness: 17 mm/0.68 in
- Weight: 107 g/3.77 oz (with elastomer bracelet), 182 g/42 oz (with titanium bracelet)

Wireless tank pressure transmitter:

- Max. diameter: 40 mm/1.57 in
- Length: 80 mm/3.15 in
- Weight: 118 g/4.16 oz
- Resolution: 1 bar/1 psi
- Rated working pressure 300 bar / 4000 psi, maximum allowed pressure 400 bar / 5800 psi.

Depth gauge:

- Temperature compensated pressure sensor
- Calibrated complying with EN 13319
- Maximum depth of operation: 150 m/492 ft (complying with EN 13319)
- Accuracy: ± 1% of full scale or better from 0 to 150 m/492 ft at 20°C/68°F (complying with EN 13319)
- Depth display range: 0 to 300 m/984 ft
- Resolution: 0.1 m from 0 to 100 m/1 ft from 0 to 328 ft

Other displays

- Dive time: 0 to 999 min, counting starts and stops at 1.2 m /4 ft depth
- Surface time: 0 to 99 h 59 min
- Dive counter: 0 to 99 for repetitive dives
- No-decompression time: 0 to 99 min (- - after 99)
- Ascent time: 0 to 999 min (- - after 999)
- Ceiling depths: 3.0 to 135 m /10 to 443 ft
- Air time: 0 to 99 min (- - after 99)

Temperature display:

- Resolution: 1°C/1°F
- Display range: -20 to +50°C/-4 to +122°F
- Accuracy: ± 2°C/± 3.6°F within 20 minutes of temperature change

Calendar clock:

- Accuracy: ± 25 s/month (at 20°C/68°F)
- 12/24 h display

Displays only in MIXED and CCR mode:

- Oxygen %: 5–99
- Helium %: 1–95
- Oxygen partial pressure display: 0.0–3.0 bar.
- Oxygen Limit Fraction: 0–200% with 1% resolution

Logbook/dive profile memory:

- Air, Mixed, CCR, and Gauge dive recording rate: default 20 seconds, adjustable 10, 20, 30, 60 s

- Memory capacity: approximately 140 hours of diving with 20 second recording interval (without transmitter data)
- Depth resolution: 0.3 m/1 ft

Operating conditions:

- Normal altitude range: 0 to 3,000 m/10,000 ft above sea level
- Operating temperature: 0°C to 40°C/32°F to 104°F
- Storage temperature: -20°C to +50°C/ -4°F to +122°F

It is recommended that the instrument be stored in a dry place at room temperature.

NOTE *Do not leave the dive computer in direct sunlight!*

Tissue calculation model:

- Suunto Fused RGBM algorithm (developed by Suunto and Bruce R. Wienke, BSc, MSc, PhD)
- 15 tissue compartments
- Tissue compartment halftimes for nitrogen: 1, 2, 5, 10, 20, 40, 80, 120, 160, 240, 320, 400, 480, 560 and 720 min. The on-gassing and off-gassing halftimes are the same.
- Tissue compartment halftimes are divided by a constant factor to obtain helium halftimes.
- Reduced gradient (variable) "M" values based on diving habit and dive violations. The "M" values are tracked up to 100 hours after a dive
- The EAN and oxygen exposure calculations are based on recommendations by R.W. Hamilton, PhD and currently accepted exposure time limit tables and principles.

Battery:

- One 3 V lithium battery: CR 2450
- Battery storage time (shelf life): Up to three years
- Replacement: Every years, or more often depending on dive activity
- Life expectancy at 20°C/68°F:
  - 0 dives/year –> 2 years
  - 100 dives/year –>1.5 years
  - 300 dives/year –>1 year

Transmitter battery:

- One 3V lithium battery: 1/2AA O-ring 2.00 mm x 2.00 mm
- Battery storage time (shelf life): Up to three years
- Replacement: Every two years, or more often depending on dive activity
- Life expectancy at 20°C/68°F:
  - 0 dives/year –> 3 years
  - 100 dives/year –> 2 years
  - 400 dives/year –> 1 year

The following conditions have an effect on the expected battery lifetime:

- The length of the dives
- The conditions in which the unit is operated and stored (for example, temperature/cold conditions). Below 10°C/50°F the expected battery lifetime is about 50-75% of that at 20°C/68°F.
- The quality of the battery. (Some lithium batteries may exhaust unexpectedly, which cannot be tested in advance)
- The time the transmitter has been stored until it gets to the customer. (The battery is installed in the unit at the factory)

NOTE *Low temperature or an internal oxidation of the battery may activate the battery warning even though the battery has enough capacity. In this case, the warning usually disappears when the DIVE mode is activated again.*

10.2. Suunto decompression model development

Suunto's decompression model development originates from the 1980s when Suunto implemented Bühlmann's model based on M-values in Suunto SME. Since then research and development has been ongoing with the help of both external and internal experts.

In the late 1990s Suunto implemented Dr. Bruce Wienke's RGBM (Reduced Gradient Bubble Model) bubble model to work with the earlier M-value based model. The first commercial products with the feature were the iconic Suunto Vyper and Suunto Stinger. With these products the improvement of diver safety was significant as they addressed a number of diving circumstances outside the range of dissolved-gas-only models by:

- Monitoring continuous multiday diving
- Computing closely spaced repetitive diving
- Reacting to a dive deeper than the previous dive
- Adapting to rapid ascents which produce high microbubble (silent-bubble) build-up
- Incorporating consistency with real physical laws for gas kinetics

In Suunto Fused RGBM the tissue half-times are derived from Wienke's FullRGBM where human body is modeled by fifteen different tissue groups. FullRGBM can utilize these additional tissues and model the on-gassing and off-gassing more accurately. The amounts of nitrogen and helium on-gassing and off-gassing in the tissues are calculated independently from each other.

The advantage of Suunto Fused RGBM is additional safety through its ability to adapt to a wide variety of situations. For recreational divers it may offer slightly longer no-deco times, depending on the chosen personal setting. For open-circuit technical divers it allows use of gas mixes with helium - on deeper and longer dives helium based gas mixes provide shorter ascent times. And finally, for rebreather divers the Suunto Fused RGBM algorithm gives the perfect tool to be used as a non-monitoring, set point dive computer.

10.2.1. Diver safety

Because any decompression model is purely theoretical and does not monitor the actual body of a diver, no decompression model can guarantee the absence of DCS. Experimentally it has been shown that the body adapts to decompression to some degree when diving is constant and frequent. Two personal adjustment settings (P-1 and P-2) are available for divers who dive constantly and are ready to accept greater personal risk.

⚠ **CAUTION**

Always use the same personal and altitude adjustment settings for the actual dive than for the planning. Increasing the personal adjustment setting from the planned setting as well as increasing the altitude adjustment setting can lead to longer decompression times deeper and thus to larger required gas volume. You can run out of breathing gas underwater if the personal adjustment setting has been changed after dive planning.

10.2.2. Altitude diving

The atmospheric pressure is lower at high altitudes than at sea level. After traveling to a higher altitude, you will have additional nitrogen in your body, compared to the equilibrium situation at the original altitude. This "additional" nitrogen is released gradually over time and equilibrium is restored. It is recommended that you acclimatize to a new altitude by waiting at least three hours before making a dive.

Before high-altitude diving, the instrument must be set to the Altitude Adjustment mode to adjust the calculations for the new altitude. The maximum partial pressures of nitrogen allowed by the mathematical model of the dive computer are reduced according to the lower ambient pressure.

As a result, the allowed no-decompression-stop limits are considerably reduced.

10.3. Oxygen exposure

The oxygen exposure calculations are based on currently accepted exposure time limit tables and principles. In addition to this, the dive computer uses several methods to conservatively estimate the oxygen exposure. For example:

- The displayed oxygen exposure calculations are raised to the next higher percentage value.
- The CNS % limits up to1.6 bar are based on 1991 NOAA Diving Manual limits
- The OTU monitoring is based on the long-term daily tolerance level and the recovery rate is reduced.

Oxygen related information displayed by the dive computer is also designed to ensure that all warnings and displays occur at the appropriate phases of a dive. For example, the following information will be shown before and during a dive when the computer is set in Mixed mode:

- The selected O_2% on the alternative display
- OLF% alternative display for either CNS% or OTU% (whichever is larger)
- Audible alarms are given and the OLF value starts to blink when the 80% and 100% limits are exceeded.
- Audible alarms are given and the actual PO_2 value blinks when it exceeds the preset limit.
- In dive planning, the maximum depth according to the O_2% and maximum PO_2 selected.

10.4. Isobaric counterdiffusion (ICD)

ICD is the term used to describe the physiologic effect when the diffusion of different gases occurs in opposite directions while under a constant ambient pressure. Particularly in diving, the gases are nitrogen and helium. ICD can produce the formation of bubbles in tissues where the sum of helium and nitrogen pressures exceeds ambient pressure. This situation may occur with trimix divers when they change to a deco gas containing markedly less helium and more nitrogen than the previous mix. To avoid ICD, it is advisable to carefully plan the gas changes so that the nitrogen percentage does not drastically increase with each change.

11. INTELLECTUAL PROPERTY

11.1. Trademark

Suunto and Suunto Fused RGBM are registered trademarks of Suunto Oy.

11.2. Copyright

© Suunto Oy 10/2012. All rights reserved.

11.3. Patent notice

Patents have been issued or applied for one or several features of this product.

12. DISCLAIMERS

12.1. CE

The CE mark is used to mark conformity with the European Union EMC directive 89/336/EEC.

12.2. EN 13319

EN 13319 is a European diving depth gauge standard. Suunto dive computers are designed to comply with this standard.

12.3. EN 250 / FIOH

The tank pressure gauge and dive instrument parts used in measuring the tank pressure meet the requirements set in the section of the European Standard EN 250 that concern tank pressure measurements. FIOH, notified body no.0430, has EC type-examined this type of personal protective equipment.

13. SUUNTO LIMITED WARRANTY

Suunto warrants that during the Warranty Period Suunto or a Suunto Authorized Service Center (hereinafter Service Center) will, at its sole discretion, remedy defects in materials or workmanship free of charge either by a) repairing, or b) replacing, or c) refunding, subject to the terms and conditions of this Limited Warranty. This Limited Warranty is only valid and enforceable in the country of purchase, unless local law stipulates otherwise.

Warranty Period

The Limited Warranty Period starts at the date of original retail purchase. The Warranty Period is two (2) years for display devices. The Warranty Period is one (1) year for accessories and consumable parts, including but not limited to chargeable batteries, chargers, docking stations, straps, cables and hoses.

Exclusions and Limitations

This Limited Warranty does not cover:

1. a) normal wear and tear, b) defects caused by rough handling, or c) defects or damage caused by misuse contrary to intended or recommended use;
2. user manuals or any third-party items;
3. defects or alleged defects caused by the use with any product, accessory, software and/or service not manufactured or supplied by Suunto;
4. replaceable batteries.

This Limited Warranty is not enforceable if item:

1. has been opened beyond intended use;
2. has been repaired using unauthorized spare parts; modified or repaired by unauthorized Service Center;

3. serial number has been removed, altered or made illegible in any way, as determined at the sole discretion of Suunto;
4. has been exposed to chemicals including but not limited to mosquito repellents.

Suunto does not warrant that the operation of the Product will be uninterrupted or error free, or that the Product will work in combination with any hardware or software provided by a third party.

Access to Suunto warranty service

Register your item at www.suunto.com/register and save the purchase receipt and/or registration card. For instructions how to obtain warranty service, visit www.suunto.com, contact your local authorized Suunto service center, or call Suunto Contact Center +358 2 284 1160 (national or premium rates may apply).

Limitation of Liability

To the maximum extent permitted by applicable mandatory laws, this Limited Warranty is your sole and exclusive remedy and is in lieu of all other warranties, expressed or implied. Suunto shall not be liable for special, incidental, punitive or consequential damages, including but not limited to loss of anticipated benefits, loss of data, loss of use, cost of capital, cost of any substitute equipment or facilities, claims of third parties, damage to property resulting from the purchase or use of the item or arising from breach of the warranty, breach of contract, negligence, strict tort, or any legal or equitable theory, even if Suunto knew of the likelihood of such damages. Suunto shall not be liable for delay in rendering warranty service.

14. DISPOSAL OF THE DEVICE

Please dispose of the device in an appropriate way, treating it as electronic waste. Do not throw it in the garbage. If you wish, you may return the device to your nearest Suunto representative.

GLOSSARY

Altitude dive	A dive made at an elevation greater than 300 m/1000 ft above sea level.
Ascent rate	The speed at which the diver ascends toward the surface.
ASC RATE	Abbreviation for ascent rate.
Ascent time	The minimum amount of time needed to reach the surface on a decompression stop dive.
ASC TIME	Abbreviation for ascent time.
CCR	Closed-Circuit Rebreather; scuba that recycles all exhaled gas.
Ceiling	On a decompression stop dive, the shallowest depth to which a diver may ascend based on computed nitrogen load.
Ceiling zone	On a decompression stop dive, the zone between the ceiling and the ceiling plus 1.2 m/4 ft. This depth range is displayed with two arrows pointing toward each other (the ”hour glass” icon).
Central nervous system toxicity	Toxicity caused by oxygen. Can cause a variety of neurological symptoms. The most important of which is an epileptic-like convulsion which can cause a diver to drown.
CNS	Abbreviation for central nervous system toxicity.
CNS%	Central nervous system toxicity limit fraction. Also note Oxygen Limit Fraction
Compartment	See "Tissue group".
DAN	Abbreviation for Divers Alert Network.
DCS	Abbreviation for decompression sickness.
DM4	Suunto DM4 with Movescount, a software for managing your dives

Decompression	Time spent at a decompression stop, or range, before surfacing, to allow absorbed nitrogen to escape naturally from tissues
Decompression range	On a decompression stop dive, the depth range between the floor and the ceiling within which a diver must stop for some time during ascent.
Decompression sickness	Any of a variety of maladies resulting either directly or indirectly from the formation of nitrogen bubbles in tissues or body fluids, as a result of inadequately controlled decompression. Commonly called "the bends" or "DCS".
Dive series	A group of repetitive dives between which the dive computer indicates some nitrogen loading is present. When nitrogen loading reaches zero the dive computer deactivates.
Dive time	Elapsed time between leaving the surface to descend, and returning to the surface at the end of a dive.
ΔP	Delta P, describing the Cylinder Pressure drop during the dive; the difference in cylinder pressure between the beginning and end of a dive.
EAD	Abbreviation for equivalent air depth.
EAN	Abbreviation for enriched air nitrox.
Enriched air nitrox	Also called nitrox or Enriched Air = EANx. Air that has some oxygen added. Standard mixes are EAN32 (NOAA Nitrox I = NN I) and EAN36 (NOAA Nitrox II = NN II).
Equivalent air depth	Nitrogen partial pressure equivalent table.
Floor	The deepest depth during a decompression stop dive at which decompression takes place.

Half time	After a change in ambient pressure, the amount of time required for the partial pressure of nitrogen in a theoretical compartment to go half way from its previous value to saturation at the new ambient pressure.
He%	Helium percentage or helium fraction in the breathing gas.
HP	Abbreviation for high pressure (= cylinder pressure).
MOD	The maximum operating depth of a breathing gas is the depth at which the partial pressure of oxygen (PO_2) of the gas mix exceeds a safe limit.
Multi level dive	A single or repetitive dive that includes time spent at various depths and whose no decompression limits are therefore not determined solely by the maximum depth attained.
Nitrox	In sports diving, refers to any mix with a higher fraction of oxygen than standard air.
NOAA	United States National Oceanic and Atmospheric Administration.
No decompression time	The maximum amount of time a diver may remain at a particular depth without having to make decompression stops during the subsequent ascent.
No decompression dive	Any dive which permits a direct, uninterrupted ascent to the surface at any time.
NO DEC TIME	Abbreviation for no decompression time limit.
OC	Open-circuit; scuba that exhausts all exhaled gas.
OEA = EAN = EANx	Abbreviations for oxygen enriched air nitrox.
OLF	Abbreviation for oxygen limit fraction.
OTU	Abbreviation for oxygen tolerance unit.

Oxygen tolerance unit	Used to measure the whole-body-toxicity.
Oxygen limit fraction	A term used by Suunto for the values displayed in the oxygen toxicity bar graph. The value is either the CNS% or the OTU%.
O_2%	Oxygen percentage or oxygen fraction in the breathing gas. Standard air has 21% oxygen.
Oxygen partial pressure	Limits the maximum depth to which the nitrox mixture can be safely used. The maximum partial pressure limit for enriched air diving is 1.4 bar. The contingency partial pressure limit is 1.6 bar. Dives beyond this limit risk immediate oxygen toxicity.
PFO	Abbreviation for patent foramen ovale. It is a form of congenital heart defect that enables blood flow between the left and right atria via the interatrial septum.
PO_2	Abbreviation for oxygen partial pressure.
RGBM	Abbreviation for Reduced Gradient Bubble Model.
Reduced Gradient Bubble Model	Modern algorithm for tracking both dissolved and free gas in divers.
Repetitive dive	Any dive whose decompression time limits are affected by residual nitrogen absorbed during previous dives.
Residual nitrogen	The amount of excess nitrogen remaining in a diver after one or more dives.
SCR	SCR Semi-closed Circuit Rebreather; scuba that recycles a portion of exhaled gas.
Scuba	Any self-contained underwater life support system.
SURF TIME	Abbreviation for surface interval time.

Surface interval time	Elapsed time between surfacing from a dive and beginning a descent for the subsequent repetitive dive.
Tissue group	Theoretical concept used to model bodily tissues for the construction of decompression tables or calculations.
Trimix	A breathing gas mix of helium, oxygen and nitrogen.
UHMS	Abbreviation for Undersea and Hyperbaric Medical Society.
Whole-body toxicity	Another form of oxygen toxicity, which is caused by prolonged exposure to high oxygen partial pressures. The most common symptoms are irritation in the lungs, a burning sensation in the chest, coughing and reduction of the vital capacity. Also called Pulmonary Oxygen Toxicity. See also OTU.

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